



T H E
ACCOMPTANT's COMPANION;
O R
Young Arithmetician's Guide.

BEING

An easy Introduction to Arithmetic, in Whole Numbers, and Fractions, Vulgar and Decimal, each Rule exemplified by a Number of Examples to make the whole Plain and Familiar; Interest, Simple and Compound, Annuities, Rebate, and Equation of Payments: Exchange, Extraction of the Square and Cube Roots and their Application to Use.

A Collection of Questions with their Answers, serving to illustrate all the Rules; with variety of Receipts, Promissory Notes, Bills of Parcels, &c. to qualify Youth for Trade and Business.

To which is added,

An Appendix of Cross Multiplication, applied to Mensuration, as used by different Artificers; with a few Questions for the Amusement of those who have made a Progress in Numbers; and a Perpetual Almanack.

The Whole

Designed for the Use of Schools, and is recommended by several eminent Mathematicians and Schoolmasters.

THE SECOND EDITION, Corrected, Augmented and Improved.

By THOMAS HARPER,
Master of the Academy in *Harley-Street, Cavendish-Square.*

L O N D O N:

Printed for and Sold by the Author: as also by T. NEWBERRY at the Crown in *Pater-noster-Row*; and H. WEBLEY, in *Holburn.*

MDCCLXV.

1578 / 4530.

T H E

P R E F A C E.

 *Notwithstanding the Reader is briefly informed in the Title Page, of the Contents and Design of this Book; yet I chuse to say something in respect of its Utility, and the many necessary Additions I have inserted in this Edition.*

In the first four or five Rules I have made but little Alteration except in the Explanation; and the Rules for working them, I have endeavoured to make more full and explicit.

Vulgar and Decimal Arithmetic are rendered Easy and Familiar to the meanest Capacity; especially the abbreviating Part of Vulgar Fractions, which I have fully explained, as the Knowledge of them are of great Advantage in other Rules.

Interest, as applied to Commissions, Brokage, Purchasing of Stocks, &c. I have placed after Decimal Arithmetic; as most Operations in Interest are soonest performed by Decimals; but as different Masters have various Methods of teaching the Rules of Arithmetic, they are so contrived as to have no Dependance on each other. At the latter Part of the Book, I have given Interest and Annuities in Mr. Ward's Method, with this Difference, that here are explained the Rules or Theorems in Words, as being most suitable to the Arithmetician.

P R E F A C E.

Exchange I have greatly Improved by several useful Additions and Amendments, by inserting the conversion of Jamaica Currency into sterling Money, and adding various Forms of Writings relative to Mercantile Affairs, Invoices, Account of Sales; together with Examples of Bills of Exchange, both Inland and Foreign (most of which have been taken from real Trade) also Bills of Parcels, Book Debts, Receipts, Promissory Notes, Orders for Goods, a Form of a Letter to and from a Factor: all which is explained in a short and significant Manner.

I have likewise shewn the method of extracting the Square and Cube Roots; as also a Vulgar Fraction and Mixed Number; demonstrated by easy and familiar Rules, and have annexed a number of Questions serving to illustrate their Use, relative to Measuring, &c.

I have next inserted a large Collection of Questions with their Answers, serving to exercise the foregoing Rules; they are so calculated as to be of Use in any Business a Youth may be designed for: which Maxim I have endeavoured to observe throughout the whole Work.

To render it of more general Use, I have added as an Appendix, the squaring of Dimensions commonly called Cross Multiplication, as likewise the Manner of Measuring different Artificers Work, as Bricklayers, Carpenters, Painters, &c. with their application to Use. Illustrated with a Variety of Examples.

Lastly, I have annexed a few Questions as an Amusement to such who have made some Progress in Numbers, and have concluded with three Tables serving as a perpetual Almanack to the Year two Thousand, and may be continued for ever.

*I have been very careful in revising the whole Work, and inserting the necessary Additions and Alterations made in this Impression, which I hope will meet with the like favourable Reception from the Public, and the worthy Gentlemen of the Profession in particular (who have made use of it in their respective Schools) as the former Edition has done, and for which kind Reception I think I cannot better testify my Gratitude, than by endeavouring to promote, to the utmost of my Abilities, the noble and useful Science,
ARITHMETIC.*



WE, whose Names are underwritten, having perused a Book, intitled, *The Accomptant's Companion, or the Young Arithmetician's Guide*, not only recommend the Use of it to others, for the speedy Improvement of Youth in Arithmetic, but also subscribe to the same for the Use of our Schools.

Mr. *Rose*, master of the academy at Chiswick.

Wm. Crawford, A. M. and master of the academy at Newington Butts.

Mr.

Mr. *Crawford*, master of the academy in Cross-Street, Hatton Garden.

Mr. *Gerrard*, master of the academy at Camberwell.

Mr. *Davis*, master of the brewers grammar school, Islington.

—*Dick*, A. M. schoolmaster, in Hart-Street, Covent Garden.

John Rule, A. M. and master of the academy at Islington.

The Rev. Mr. *Davies*, master of the academy in Charles Street, Westminster.

Mr. *Roberts*, master of the academy at Putney.

Mr. *Fenwick*, writing master and accomptant, in Dean's Yard, Westminster.

Mr. *Earle*, master of the boarding school at Dulwich.

Mr. *Shields*, master of the academy at Islington.

Mr. *Massey*, master of the academy in Fenchurch Street.

Mr. *Baddely*, master of the academy at Hoxton.

Mr. *Hodgson*, master of the boarding school, at Battersea.

Mr. *Shaw*, master of the boarding school at West End.

Mr,

Mr. *Morton*, master of the academy in Wine Office Court, Fleet Street.

Mr. *Pierce*, schoolmaster at Ealing.

Mr. *Stursacre*, master of the academy in Charles Street, St. James's.

Mr. *Quin*, schoolmaster in Red Lyon Street, Holbourn.

Mr. *Pennington*, schoolmaster at Watlington, Oxon.

Mr. *Bond*, schoolmaster, near the Burroughs Walls, Bath.

Mr. *Ferguson*, master of the academy in Great Hermitage Street, Wapping.

Mr. *Telliere*, master of the academy in Paradise Row, Chelsea.

Mr. *Day*, master of the boarding school at Fulham.

Mr. *Reay*, master of the boarding school at Kentish Town.

Mr. *Cooper*, writing master and accomptant at ditto.

Mr. *Young*, master of the academy at Kensington Gravel Pits.

Mr. *Chiffinch*, master of the mathematical school in Rose Street, near Old Street,

Mr.

Mr. *Churchod*, master of the academy in Wellclose Square.

Mr. *Davies*, master of the academy on mount Pleasant, near old Gravel Lane, Ratcliff Highway.

Mr. *Weetch*, master of the academy, Limehouse

Mr. *Suxpeach*, schoolmaster, in Brook Street, Ratcliff.

Mr. *Williamson*, accomptant, in Princes Street, Cavendish Square.

Mr. *Waller*, writing master and accomptant in Woodstreet.

Mr. *Slade*, teacher of the mathematicks in Paradise Row, Chelsea.

Mr. *Bakewell*, master of the boarding school in Little Peter Street, Westminster.

Mr. *Mearns*, schoolmaster, in Strutton Ground, Westminster.

Mr. *Hill*, surveyor and accomptant, of St Giles and Bloomsbury.

Mr. *Amos*, writing master and accomptant, near Princes Square, Ratcliff Highway.

Mr. *Brett*, writing master and accomptant at Bath

Mr.

Mr. *Cope*, schoolmaster, St. Thomas's Lane,
Bristol.

Mr. *Keep*, writing master and accomptant at
the grammar school, Bath.

Mr. *Robinson*, master of the boarding school at
Harrow.

Mr. *Morgan*, schoolmaster in Seething Lane.

Mr. *Broadhead*, writing master and accomptant
in Church Street, Hackney.

Mr. *Pearce*, writing master and accomptant,
in Salisbury Court, Fleet Street.

Mr. *Quin*, writing master and accomptant, in
the Hay-market.

Mr. *Green*, writing master and accomptant, in
Wytch Street, Drury Lane.

Mr. *Kendall*, writing master and accomptant, in
Great Wild Street.

Mr. *Davison*, writing master and accomptant, in
Primrose Street, Moor Fields.

Mr. *White*, master of Bow school, Cheapside.

Mr. *Refier*, writing master and accomptant, in
New Castle Court, Butcher Row.

Mr. *Carteret*, school master, in Well Close
Square.

Mr.

Mr. *Goodgier*, schoolmaster in New Square,
Minories.

Mr. *White*, schoolmaster, in George Street,
Spittle Square.

Mr. *Jenkin*, master of Raine's school, in Old
Gravel Lane, Ratcliff Highway.

Mr. *Jackson*, schoolmaster, in Wood's Close,
Clerkenwell.

Mr. *Michon*, schoolmaster, in Red Lyon Mar-
ket, St. Luke's.

Mr. *Shortland*, schoolmaster, in St. Anne's Lane,
Aldersgate.

Mr. *Healer*, schoolmaster, in Drury Lane.

Mr. *Belias*, master of the free-school at Chelsea.

CONTENTS.

					Page
N otation	_____	_____	_____		1
Addition		_____	_____	_____	2
Subtraction	_____		_____	_____	15
Multiplication		_____	_____	_____	20
Division	_____		_____		28
Reduction	_____	_____	_____	_____	31
Single Rule of Three Direct			_____	_____	38
_____ Inverse			_____	_____	43
Practice	_____	_____	_____	_____	44
Tare and Tret	_____	_____	_____	_____	51

Vulgar Fractions.

Abbreviation of ditto	_____	_____	55
Reduction of ditto	_____	_____	57
Addition	_____	_____	61
Subtraction	_____	_____	62
Multiplication	_____	_____	63
Division	_____	_____	64
Single Rule of Three Direct	_____	_____	65
_____ Inverse	_____	_____	66
Double Rule of Three	_____	_____	ibid.

Decimal Fractions.

Notation of ditto	_____	_____	_____	67
Addition	_____	_____	_____	68
Subtraction	_____	_____	_____	69
Multiplication	_____	_____	_____	ibid.
Division	_____	_____	_____	70
Reduction	_____	_____	_____	ibid.
Rule of Three	_____	_____	_____	73

Simple Interest	_____	_____	75
Factorage	_____	_____	76
Purchasing of Stocks	_____	_____	ibid.
Brokage	_____	_____	78
Compound Interest	_____	_____	82
Rebate or Discount	_____	_____	84
Equation of Payments	_____	_____	85
Barter or Truck	_____	_____	86
Loss and Gain	_____	_____	87
Fellowship	_____	_____	88
_____ with Time	_____	_____	90

Mr. *Goodgier*, schoolmaster in New Square,
Minories.

Mr. *White*, schoolmaster, in George Street,
Spittle Square.

Mr. *Jenkin*, master of Raine's school, in Old
Gravel Lane, Ratcliff Highway.

Mr. *Jackson*, schoolmaster, in Wood's Close,
Clerkenwell.

Mr. *Michon*, schoolmaster, in Red Lyon Mar-
ket, St. Luke's.

Mr. *Shortland*, schoolmaster, in St. Anne's Lane,
Aldersgate.

Mr. *Healer*, schoolmaster, in Drury Lane.

Mr. *Belias*, master of the free-school at Chelsea.

CONTENTS.

					Page
N otation	_____	_____	_____		1
Addition	_____	_____	_____		2
Subtraction	_____	_____	_____		15
Multiplication	_____	_____	_____		20
Divison	_____	_____	_____		28
Reduction	_____	_____	_____		31
Single Rule of Three Direct	_____	_____	_____		38
_____ Inverse	_____	_____	_____		43
Practice	_____	_____	_____		44
Tare and Tret	_____	_____	_____		51

Vulgar Fractions.

Abbreviation of ditto	_____	_____	55
Reduction of ditto	_____	_____	57
Addition	_____	_____	61
Subtraction	_____	_____	62
Multiplication	_____	_____	63
Division	_____	_____	64
Single Rule of Three Direct	_____	_____	65
_____ Inverse	_____	_____	66
Double Rule of Three	_____	_____	ibid.

Decimal Fractions.

Notation of ditto	_____	_____	_____	67
Addition	_____	_____	_____	68
Subtraction	_____	_____	_____	69
Multiplication	_____	_____	_____	ibid.
Division	_____	_____	_____	70
Reduction	_____	_____	_____	ibid.
Rule of Three	_____	_____	_____	73

Simple Interest	_____	_____	75
Factorage	_____	_____	76
Purchasing of Stocks	_____	_____	ibid.
Brokage	_____	_____	78
Compound Interest	_____	_____	82
Rebate or Discount	_____	_____	84
Equation of Payments	_____	_____	85
Barter or Truck	_____	_____	86
Loss and Gain	_____	_____	87
Fellowship	_____	_____	88
_____ with Time	_____	_____	90

C O N T E N T S.

	Page
Double Rule of Three	91
Exchange	96
Foreign Bills	103
Comparison of Weights and Measures	104
Conjoined Proportion	ibid.
Progression Arithmetical	105
Geometrical	106
Variation of Quantities	108
Combination	109
Alligation Medial	ibid.
Alternate	110
Position Single	113
Double	114
Extraction of the Square Root	116
Vulgar Fractions	118
Extraction of the Cube Root	120
Vulgar Fractions	123
Simple Interest	125
Rebate or Discount	127
Annuities or Pensions in Arrears	129
Present Worth of Annuities	131
Annuities, &c. in Reversion	133
Equation of Payments	135
Compound Interest	ibid.
Annuities or Pensions in Arrears	138
Present Worth of Annuities	139
Annuities, &c. in Reversion	140
Purchasing Freehold Estates	142
Rebate or Discount	143
Practical Questions	144
Bills of Parcels	158
Book Debts	163
Commercial Correspondence	167 172
Invoices	168
Receipts	173
Promissory Notes	175
Inland Bills of Exchange	177
Cross Multiplication	178
Collection of Questions	184
A Table shewing the Dominical Letter	190
what Day of the week any Month begins on for ever	} 191
Day of the Month for ever	192



Of ARITHMETIC.

RITHMETIC is an Art, or Science, which treats of the Power and Use of Numbers, and consists of three Parts, *viz.*

- 1, Whole Numbers.
- 2, Vulgar Fractions.
- 3, Decimal Fractions.

Arithmetic is likewise Theoretical and Practical.

Theoretical Arithmetic regards the Nature and Quality of Numbers, and shews the Reason and Foundation of practical Operations; in this Sense, it is termed a Science.

Practical Arithmetic shews the Method of working those Demonstrations by Numbers, so as to be most useful and expeditious for Business; and, in this Sense, it is termed an Art, and is founded upon these five following Rules, *viz.* Notation, Addition, Subtraction, Multiplication, and Division.

Of NOTATION.

NOTATION shews the manner of expressing any Sum by certain Characters, or Figures.

The Characters used by the antient *Romans* were the seven following, *viz.*

I.	V.	X.	L.	C.	D.	M.
One,	Five,	Ten,	Fifty,	One Hundred,	Five Hundred,	One Thousand.

But the Moderns express Numbers by the ten following Marks or Figures, call'd *Arabic*, *viz.* One, 1; Two, 2; Three, 3; Four, 4; Five, 5; Six, 6; Seven, 7; Eight, 8; Nine, 9; Nought, or Cypher, 0.

The T A B L E.

9	8	7	6	5	4	3	2	1
Hundreds of Millions	Tens of Millions	Millions	Hundreds of Thousands	Tens of Thousands	Thousands	Hundreds	Tens	Units

The Value of each Figure is known by the Place it possesses; the first Figure towards the right Hand expresses its Value in Units, the second in Tens, the third in Hundreds, the fourth in thousands, &c. each Figure being ten Times the Value of that on its Right Hand,

E X A M P L E S.

Write down the following Numbers in proper Figures.

Forty eight

One Hundred and Forty-four

Two Thousand and Sixty-six

Fifty Thousand Six Hundred and Four

Eleven Thousand Eleven Hundred and Eleven

One Hundred and Seventy Millions Six Hundred and

Fifty-nine Thousand Eleven Hundred and Twelve

Write down the following Numbers, in Words, at length, *viz.*

89—711—4171—417614—7917111—741716111.

A D D I T I O N,

IS the gathering together two or more Numbers or Sums into one total Sum, of which there are two Sorts, Simple and Compound.

O F S I M P L E A D D I T I O N.

Simple Addition is the adding together two, or more, Numbers of the same Name or Quality, as 9 Pounds and 7 Pounds make 16 Pounds, &c.

GE-

GENERAL RULE.

Place all Numbers of the same Kind under one another, add up the Units, and, if their Sum be under Ten, set that Sum underneath; but if equal to Ten, or Tens, set the Excess underneath; and, for every ten, carry an Unit to the next Place; and so proceed to the last Row, and then put down the total Amount.

The Proof of Addition of any Denomination is performed by adding the whole Sum up; then omit the top Line (or any other) and add all the rest up into one Sum; then join the Line you omitted to this last Sum, and if it be the same as your Sum Total it is right; or else add the whole up twice, beginning one Time at the Bottom of your Sum, and the other at the Top, and so proceed, and if both Additions are the same, the Work is right.

EXAMPLES.

10 £.	10 Yds.	10 Days	10 Tons	10 lb.
7	47	586	4876	987567
8	53	749	6257	624378
5	29	837	8216	856295
6	37	496	7359	747847
3	46	327	8736	968475
5	72	540	5943	217268
8	14	479	7835	728743
4	34	896	6929	583428
—	—	—	—	—
—	—	—	—	—

COMPOUND ADDITION.

Is the adding together several Numbers of divers Denominations, as Pounds, Shillings and Pence, Hundreds, Quarters, Pounds, &c.

Of MONEY.

Marked.

4 Farthings	make	1 Penny	a.	$\frac{1}{4}$	Farthing.
12 Pence	—	1 Shilling	s.	$\frac{1}{2}$	Halfpenny
20 Shillings	—	1 Pound	£.	$\frac{1}{4}$	Three Farthings.

4 *Addition.*

ACCOMPTANT'S

There are some other Names of Money used in England, as

		£.	s.	d.
A Moidore	<i>is equal to</i>	1	7	0
A Guinea	_____	1	1	0
A Half-Guinea	_____	0	10	6
A Quarter of a Guinea	_____	0	5	3
A Crown	_____	0	5	0
A Half-Crown	_____	0	2	6

The following are only imaginary Pieces:

A Jacobus	<i>is</i>	1	5	0
A Carolus	—	1	3	0
A Mark	—	0	13	4
An Angel	—	0	10	0
A Noble	—	0	6	8

Before I proceed any farther, I think it will be better to give the following Tables, which may be learnt by Heart.

Table of Pence.

a.	£.	s.	d.
12 are equal to	0	1	0
20	0	1	8
24	0	2	0
30	0	2	6
36	0	3	0
40	0	3	4
48	0	4	0
50	0	4	2
60	0	5	0
70	0	5	10
72	0	6	0
80	0	6	8
84	0	7	0
90	0	7	6
96	0	8	0
100	0	8	4
108	0	9	0
110	0	9	2
120	0	10	0
240	1	0	0
252	1	1	0

Note, 48 Farthings 0 1 0
960 Farthings 1 0 0

Table of Shillings.

s.	£.	s.
20 are equal to	1	0
30	1	10
40	2	0
50	2	10
60	3	0
70	3	10
80	4	0
90	4	10
100	5	0
110	5	10
120	6	0
130	6	10
140	7	0
150	7	10
160	8	0
170	8	10
180	9	0
190	9	10
200	10	0
300	15	0
400	20	0
500	25	0
1000	50	0

EXAMPLES.

10	20	12	4
£.	s.	d.	
3	11	6	
2	10	7 $\frac{3}{4}$	
4	11	3	
1	10	1 $\frac{1}{2}$	

10	20	12	4
£.	s.	d.	
4	11	3 $\frac{1}{2}$	
9	10	11 $\frac{3}{4}$	
7	10	11 $\frac{1}{2}$	
1	13	1 $\frac{1}{2}$	

10	20	12	4
£.	s.	d.	
14	11	3 $\frac{1}{2}$	
11	19	10 $\frac{1}{4}$	
31	17	6 $\frac{1}{2}$	
11	11	11 $\frac{1}{2}$	

10	20	12	4
£.	s.	d.	
76	10	4 $\frac{3}{4}$	
42	11	5 $\frac{1}{2}$	
87	12	6 $\frac{1}{4}$	
24	13	2 $\frac{1}{2}$	

10	20	12	4
£.	s.	d.	
1	11	6 $\frac{1}{2}$	
4	10	7	
6	19	8 $\frac{3}{4}$	
7	17	10 $\frac{1}{2}$	
2	17	10	
6	10	9 $\frac{1}{2}$	
2	11	8 $\frac{1}{2}$	

10	20	12	4
£.	s.	d.	
8	9	6 $\frac{1}{2}$	
5	4	7	
7	12	3	
5	19	6 $\frac{3}{4}$	
6	14	7	
9	15	6 $\frac{1}{2}$	
4	18	9	

10	20	12	4
£.	s.	d.	
78	13	10 $\frac{1}{4}$	
12	18	11 $\frac{1}{2}$	
49	17	9 $\frac{3}{4}$	
18	10	8 $\frac{1}{2}$	
76	11	7 $\frac{1}{2}$	
98	12	6 $\frac{3}{4}$	
12	13	5 $\frac{1}{2}$	

10	20	12	4
£.	s.	d.	
411	13	11 $\frac{1}{2}$	
178	10	10 $\frac{1}{2}$	
234	11	19 $\frac{1}{2}$	
567	18	8 $\frac{3}{4}$	
819	11	7 $\frac{1}{2}$	
512	13	6 $\frac{1}{4}$	
148	11	5 $\frac{1}{2}$	

10	20	12	4
£.	s.	d.	
11	11	6 $\frac{1}{2}$	
14	13	11 $\frac{3}{4}$	
98	14	9 $\frac{1}{4}$	
11	17	8 $\frac{3}{4}$	
18	16	7 $\frac{1}{2}$	
11	11	6 $\frac{3}{4}$	
14	10	5 $\frac{1}{2}$	
11	17	4 $\frac{1}{4}$	
17	11	3 $\frac{1}{2}$	

10	20	12	4
£.	s.	d.	
24	12	7 $\frac{1}{4}$	
89	17	9 $\frac{1}{2}$	
75	14	7 $\frac{1}{2}$	
39	16	8 $\frac{1}{4}$	
98	15	11 $\frac{3}{4}$	
56	19	6 $\frac{1}{2}$	
74	18	10 $\frac{1}{4}$	
68	14	6 $\frac{1}{2}$	
97	9	6 $\frac{1}{4}$	

10	20	12	4
£.	s.	d.	
511	13	6 $\frac{1}{2}$	
718	14	7 $\frac{1}{4}$	
416	12	9 $\frac{1}{2}$	
719	11	3 $\frac{1}{2}$	
418	17	7 $\frac{1}{2}$	
716	16	8 $\frac{1}{4}$	
419	15	9 $\frac{3}{4}$	
417	14	1 $\frac{1}{2}$	
412	10	6 $\frac{1}{4}$	

10	20	12	4
£.	s.	d.	
511	19	6 $\frac{1}{2}$	
111	11	9 $\frac{3}{4}$	
714	13	11 $\frac{1}{4}$	
911	17	7 $\frac{3}{4}$	
617	16	8 $\frac{1}{2}$	
181	15	9 $\frac{1}{2}$	
419	14	6 $\frac{1}{4}$	
761	13	5 $\frac{3}{4}$	
141	10	4 $\frac{1}{2}$	

Note, The Numbers placed over the Characters shew at what you must carry. Ex-

Of TROY-WEIGHT.

24 Grains	<i>make</i>	1 Pennyweight	dwt.
20 Pennyweight	—	1 Ounce	oz.
12 Ounces	—	1 Pound	lb.

This Weight only gives five Score to the Hundred; and by it is weighed Gold, Silver, Jewels, Bread, and Liquors.

Note, The Standard for Gold Coin is 22 Carrats of fine Gold and 2 Carrats of Copper melted together. For Silver is 11 oz. 2 dwts. of fine Silver and 18 dwts. of Copper.

EXAMPLES.

10	12	20	24	12	20	24	12	20	24	10	12	20	24
lb.	oz.	dwt.	gr.	oz.	dwt.	gr.	oz.	dwt.	gr.	lb.	oz.	dwt.	gr.
1	10	13	11	4	11	17	6	12	14	16	11	19	18
7	11	14	12	5	10	14	9	11	15	71	10	18	17
4	10	15	13	6	15	19	8	14	10	14	9	17	16
1	6	16	14	7	14	17	9	15	18	13	6	11	13
6	8	17	15	8	13	12	5	11	12	11	11	17	11
1	9	18	16	9	11	17	7	10	14	19	10	16	10
7	7	19	17	8	14	16	9	12	15	16	9	15	11
4	6	17	18	7	15	12	8	13	14	19	8	13	12
6	5	16	19	8	13	17	7	12	16	98	7	12	14
9	4	13	20	9	15	14	5	15	11	64	6	11	16

Of AVOIRDUPOIS WEIGHT.

16 Drams	<i>make</i>	1 Ounce	oz.
16 Ounces	—	1 Pound	lb.
28 Pounds	—	1 Quarter of an hundred wt.	gr.
4 Quarters	—	1 Hundred wt. or 112 Pounds C.	
20 Hundred weight	—	1 Ton	Tn.

Note, This Weight is used in weighing any Thing of a gross Nature, as all Grocery and Chandlery Wares, and all Metals, except Silver and Gold, but differeth in divers Goods and Places, by Custom and Statute Law; for

COMPANION.

Addition. 7

A Barrel of Anchovies is	30	A Faggot of Steel	—	120
Figs, from }	98	A seam of Glas	—	120
268 Pounds, to }		A Burden of Gad Steel		180
A Barrel of Raisins	— 112	For Cheefe and Butter		
Gunpowder	— 112	A Clove of Cheefe and	} 8	
Candles	— 120	Butter		
Potash	— 200	A Wey, in Suffolk, is	} 256	
Butter	— 224	32 Cloves, or		
Soap	— 256	In Essex, is 42 Cloves, or		336
A Puncheon of Prunes is		For Wool.		
10 or 12 hundred		A Clove of Wool	is	7
A Fodder of Lead is 19 C. 2 qrs.		A Stone	—	14
A Stone of Glas is	5	A Tod	—	28
Butchers Meat	— 8	A Wey is 6 Tod and	} 182	
Iron or Shot	— 14	one Stone, or		
Butter and Cheefe	16	A Sack is 2 Weys, or		364
A Quintal of dry Fish	100	A Last is 12 Sacks, or		4368

EXAMPLES.

10 16 16	10 16 16	10 20 4 28	10 20 4 28
lb. oz. dr.	lb. oz. dr.	T C gr. lb.	T C gr. lb.
2 10 1	12 14 10	71 10 1 10	471 10 1 17
1 12 2	18 13 11	11 11 1 11	171 11 1 18
3 14 3	21 12 9	17 9 2 10	614 10 2 16
5 11 1	62 13 7	61 8 3 17	718 11 3 15
6 15 2	28 15 8	89 7 2 16	416 17 1 13
4 8 3	35 10 11	16 16 1 15	191 18 0 10
6 14 5	63 12 10	97 13 0 14	516 16 2 19
7 12 8	73 10 4	51 14 1 13	789 15 1 17
8 11 9	62 11 8	71 11 2 12	614 13 3 11
7 3 6	73 9 5	14 10 3 12	516 19 1 10

Of APOTHECARIES WEIGHT.

20 Grains	make	1 Scruple	3
3 Scruples	—	1 Dram	3
8 Drams	—	1 Ounce	3
12 Ounces	—	1 Pound	lb.

Note, Apothecaries compound their Medicines by this Weight, but buy and sell their Drugs by Avoirdupois.

8 *Addition.*

ACCOMPTANT'S

10	12	8	3	20	10	12	8	3	20	10	12	8	3	20			
lb.	3	3	3	grs.	lb.	3	3	3	grs.	lb.	3	3	3	grs.			
7	10	5	1	14	7	11	10	1	0	17	7	16	10	1	0	17	
8	11	3	2	12	4	17	11	2	1	16	4	7	11	2	1	15	
9	7	6	1	15	6	11	10	3	2	15	6	14	11	3	1	16	
5	8	4	2	12	4	17	11	4	0	16	7	11	9	4	2	17	
7	9	5	1	17	5	17	9	5	0	17	4	7	1	8	5	0	18
8	7	4	2	12	6	18	8	6	1	18	6	14	7	6	1	19	
7	4	4	1	13	7	16	7	7	2	19	9	11	6	7	2	16	
5	10	7	2	14	4	19	6	0	0	17	4	2	5	5	1	13	

OF CLOTH MEASURE.

2 Inches and a Quarter	make	1 Nail	na.
4 Nails	—	1 Quarter of a Yard	qr.
4 Quarters	—	1 Yard	yd.
3 Quarters	—	1 Ell Flemish	E. F.
5 Quarters	—	1 Ell English	E. E.
6 Quarters	—	1 French Aulne	F. A.

Note, All Sorts of Woollen Cloths, wrought Silks, most Linens, Tape and Gartering are measured by the Yard; but some particular Linens, called Hollands, are measured by the Ell English, but Tapestry by the Ell Flemish.

EXAMPLES.

10	4	4	10	5	4	10	4	4	10	3	4
yd.	qr.	na.	E.E.	qr.	na.	yd.	qr.	na.	E.F.	qr.	na.
271	3	2	497	1	3	511	1	1	716	1	2
681	2	3	128	4	2	512	1	1	619	2	3
711	1	2	641	3	3	712	3	3	416	2	1
576	3	3	516	3	1	516	1	1	471	2	1
598	1	3	478	1	2	471	0	2	411	1	2
333	3	3	598	2	3	987	3	2	611	2	3
222	2	2	416	3	2	416	2	3	111	0	2
189	1	1	798	2	1	516	1	1	711	1	1
617	2	1	478	3	0	111	2	2	871	2	0

Of DRY MEASURE.

2 Pints	make	1 Quart	qt.
2 Quarts	—	1 Pottle	pot.
2 Pottles	—	1 Gallon	gall.
2 Gallons	—	1 Peck	pk.
4 Pecks	—	1 Bushel	buſh.
8 Bushels	—	1 Quarter of Corn	qr.
36 Bushels	—	1 Chaldron of Coals	C.

Note, This Measure is used in measuring all dry Goods, as Salt, Sand, Corn, Seeds, Seacoal, Charcoal, Small-coal, Fruit, Roots, Oysters, Cockles, and Muscles.

N. B. In the Country 32 Bushels make a Chaldron, and in London 36: Five Pecks go to a Bushel in Water Measure.

Of WATER MEASURE.

1 Score of Coals	is.	21 Chaldron
1 Sack of Coals	—	3 Bushels
1 Sack of Corn	—	4 Bushels
10 Quarters of Corn	make	1 Wey
12 Weys	are	1 Last
1 Load of Corn	is	5 Bushels
1 Cart Load	—	40 Bushels.

The standard Winchester Bushel is a Cylinder, whose Diameter is eighteen Inches and an half wide, and eight Inches deep, and contains 2150 cubical Inches and $\frac{2}{3}$.

EXAMPLES.

10 36 4	10 36 4 2	10 36 4 2	10 36 4 2 4
C b p	C b p g	C b p g	C b p g q
47 19 1	716 31 1 1	711 10 1 1	497 10 1 1 1
76 18 2	419 28 2 0	611 10 2 0	617 11 0 0 2
48 17 3	718 10 3 1	519 11 1 1	511 13 2 1 3
56 16 1	716 7 1 0	716 15 2 1	997 10 3 0 1
78 15 2	519 16 1 1	912 10 3 0	786 11 1 1 1
96 13 1	781 15 0 0	716 11 1 1	517 10 2 0 2
51 14 0	976 13 2 1	516 17 0 1	417 11 3 1 3
78 12 3	517 11 3 1	718 13 2 0	516 17 1 1 1
19 10 1	612 12 2 0	961 14 1 1	478 2 0 1 3
—	—	—	—
—	—	—	—

OF LONG MEASURE

3 Barley-Corns	<i>make</i>	1 Inch	<i>in.</i>
4 Inches	—	1 Hand	<i>hand</i>
12 Inches	—	1 Foot	<i>ft.</i>
3 Feet	—	1 Yard	<i>yd.</i>
6 Feet	—	1 Fathom	<i>fthm.</i>
5 Yards and a half	—	1 Rod, Pole or Perch	<i>rd p. ph.</i>
40 Poles	—	1 Furlong	<i>fng.</i>
8 Furlongs	—	1 Mile	<i>ml.</i>
3 Miles	—	1 League	<i>lg.</i>
60 Miles	—	1 Degree	<i>deg.</i>

This Measure is used in measuring the Distance of Places, where Length is required, and the Breadth not considered.

A Degree is commonly called 60 Miles, but is 60 and a half. A Pole, or Perch, are not always of the same length; for Fens and Wood-lands they generally reckon 18 Feet to the Pole, and for Forests 21 Feet; but the statute Measure for a Pole or Perch is 5 Yards and a half. The Hand is used in measuring of Horses, and a Fathom in taking of Depths.

EXAMPLES.

10 3 8	10 3 8 40	10 3 12 3	10 3 12 3
<i>ls. ml. f.</i>	<i>ls. ml. f. pls.</i>	<i>Yds. f. in. bc.</i>	<i>Yds. f. in. bc.</i>
711 1 7	611 1 6 17	571 1 10 1	711 1 10 1
511 2 6	519 2 7 36	611 2 9 0	611 2 11 2
612 1 6	511 0 5 19	7 6 1 11 1	718 1 9 1
787 0 5	716 1 6 17	571 2 10 2	617 1 6 2
517 2 4	519 2 3 16	611 1 9 0	519 0 5 1
615 1 3	617 1 4 11	718 0 8 1	333 1 4 0
498 1 2	519 0 5 18	516 1 1 0	468 0 0 2
716 2 1	316 1 2 13	314 0 6 2	576 2 2 1
578 0 0	781 2 1 19	719 1 5 0	389 1 1 0
561 1 1	460 0 2 11	516 2 4 1	416 2 1 2

OF LAND (or SQUARE) MEASURE.

144 Inches	<i>make</i>	1 Foot
9 Feet	—	1 Yard
100 Feet	—	1 Square of Flooring
272½ Feet	—	1 Rod of Brick-work.
40 Rods	—	1 Rood
4 Roods	—	1 Acre
640 Acres	—	1 Mile

Note, This Measure gives the Content of all Things that have Length and Breadth, such as Land, Painting, Plastering, Flooring, Plumbing, Glazing, &c.

EXAMPLES.

10 4 40	10 4 40	10 4 40	10 4 40
<i>A. r. p.</i>	<i>A. r. p.</i>	<i>A. r. p.</i>	<i>A. r. p.</i>
27 3 11	511 2 17	161 1 19	411 1 17
19 2 17	612 1 10	161 2 20	516 2 18
69 3 18	316 3 11	781 3 22	987 1 19
78 1 11	781 1 19	611 0 23	311 3 17
65 0 19	976 2 17	987 2 24	987 0 16
38 1 28	678 3 16	516 3 25	615 1 15
79 2 31	548 0 15	419 1 26	412 0 13
51 3 17	716 2 13	111 2 18	711 2 14
61 1 11	419 1 10	128 3 17	321 3 19

OF LIQUID MEASURE.

Of which there are two Sorts, *viz.* Wine Measure and Winchester Measure. Winchester is a particular Measure for Beer, Ale, &c. And Wine Measure is used in measuring all Spirits, Strong Waters, Perry, Cyder, Mead, Honey, Oil, Vinegar, &c. And the Difference between Wine and Winchester Measure is, a Gallon of Wine is 231 solid Inches, but a Gallon of Beer or Ale contains 282 solid Inches.

First, OF WINE MEASURE.

2 Pints	<i>make</i>	1 Quart
4 Quarts	—	1 Gallon
10 Gallons	—	1 Anchor of Rum or Brandy
18 Gallons	—	1 Runlet

12 Addition.

ACCOMPTANT'S

31 Gallons and a half	make	1 Barrel
42 Gallons	_____	1 Tierce
63 Gallons	_____	1 Hogthead
84 Gallons	_____	1 Puncheon
2 Hogheads	_____	1 Pipe or Butt
2 Pipes, or 4 Hhds.	_____	1 Tun.

This Measure is used in measuring all Brandies, Spirits, Strong Waters, Perry, Cyder, Mead, Vinegar, Honey, and Oil.

EXAMPLES.

10 4 63	10 4 63	10 4 63 4	10 2 2 63 4
<i>t. h. g.</i>	<i>t. h. g.</i>	<i>t. h. g. q.</i>	<i>t. p. h. g. q.</i>
34 3 24	76 3 28	44 3 62 3	23 1 1 29 2
25 3 27	52 2 30	34 2 59 2	32 0 1 37 2
72 2 29	73 3 34	49 2 47 3	49 1 1 36 3
84 3 37	84 2 32	59 0 33 0	54 0 0 33 2
93 2 35	73 3 35	42 3 32 2	87 0 0 24 3
76 3 32	82 2 33	36 0 33 3	69 1 0 20 2
54 2 39	74 3 35	87 3 34 2	79 0 1 22 3
72 2 27	62 2 32	63 2 45 0	89 1 0 23 2
53 3 23	73 2 39	87 3 36 2	96 0 0 28 3

Second, OF WINCHESTER MEASURE.

2 Pints	_____	} make {	1 Quart
4 Quarts	_____		1 Gallon
8 Gallons	_____		1 Firkin of Ale
9 Gallons	_____		1 Firkin of Beer in London
2 Firkins	_____		1 Kilderkin
4 Firkins	_____		1 Barrel
1½ Barrel, or 54 Gallons			1 Hogthead
2 Hhds. or 3 Barrels	_____		1 Butt.

Note, In all Places in England, but London, 34 Gallons make a Barrel of both Strong and Small Beer, and eight Gallons and a Half one Firkin.

A Barrel of Salmon, or Eels	} is {	42 Gallons
A Barrel of Herrings		32 Gallons
A Keg of Sturgeon		4 or 5 Gallons
A Firkin of Soap		8 Gallons

Ex-

EXAMPLES.

10 54 4 <i>Hbds. gl.qts.</i>	10 4 9 <i>b.b. f.gl.</i>	10 4 8 <i>b.a. f.gl.</i>	10 54 4 <i>Hbds. gl.qts.</i>
726 29 2	526 2 7	446 3 7	474 49 2
638 51 3	539 0 6	559 3 7	552 53 2
526 27 0	784 2 5	659 2 6	498 44 3
782 36 0	634 3 4	547 2 5	746 36 2
567 44 2	726 3 3	427 0 4	527 47 0
497 43 3	498 0 2	542 3 2	498 48 2
927 32 0	706 2 8	657 0 3	746 35 3
839 20 2	526 3 0	293 3 2	349 25 2
746 29 3	456 3 2	457 2 4	474 40 0

OF TIME.

60 Seconds	-	-	-	} make {	1 Minute	'
60 Minutes	-	-	-		1 Hour	<i>h.</i>
24 Hours	-	-	-		1 Day	<i>d.</i>
7 Days	-	-	-		1 Week	<i>w.</i>
4 Weeks	-	-	-		1 Month	<i>m.</i>
13 Months, 1 Day & 6 Hrs.					1 Common, or Julian Year	

N. B. A Solar Year contains 365 Days, 5 Hours, 48 Minutes, and 57 Seconds, according to the best Computation.

To remember the Days contained in each Month, observe the following Verse :

Thirty Days hath *September*,
April, *June*, and *November* ;
 All the rest hath thirty-one,
 Except *February* alone,
 Which hath but twenty-eight days clear,
 And twenty-nine ev'ry Leap-Year.

EXAMPLES.

10	13	4	24	60	60
y.	m.	w.	b.	m.	s.
11	10	1	14	29	37
17	11	2	17	27	37
97	9	1	18	28	39
41	8	0	19	21	31
11	7	1	15	26	33
17	6	2	14	25	30
49	5	1	13	23	31
14	4	3	11	20	31
16	3	1	10	21	30

10	4	7	24
m.	w.	d.	b.
517	1	3	19
174	2	3	16
514	3	4	17
574	1	2	15
633	2	6	19
937	1	5	17
436	0	4	15
439	1	3	16
331	0	2	13

10	4	7	24	60
m.	w.	d.	b.	m.
741	1	6	17	19
156	2	5	18	21
739	3	4	19	30
429	1	3	20	49
678	0	2	21	57
519	1	1	22	41
498	2	0	23	36
417	3	1	19	20
426	1	0	17	21

Of Things bought and sold by the Tale.

12 Particulars	-	-	-	} make {	1 Dozen	doz.
12 Dozen	-	-	-		1 Grofs	grfs.
12 Grofs, or 144 Dozen	-	-	-		1 Great Grofs	g grfs.

PAPER AND PARCHMENT.

24 Sheets	—	—	} make {	1 Quire	qr.
20 Quires	—	—		1 Ream	rm.
2 Reams	—	—		1 Bund'le	bdle.
1 Dozen of Parchment	—	—		12 Skins	fsks.
12 Skins	—	—		1 Roll	rl.

OF MOTION.

60 Seconds	-	-	-	} make {	1 Minute	—	'
60 Minutes	-	-	-		1 Degree	—	°
30 Degrees	-	-	-		1 Sign	—	"
12 Signs, or 360 Degrees, make the great Circle in the Heavens called the Zodiac.							

EXAMPLES.

10	60	60
°	'	"
14	10	11
61	29	20
78	32	32
14	47	40
91	56	56
78	49	43
48	21	34
39	27	21
41	29	15

10	60	60
°	'	"
49	48	17
61	31	28
41	25	36
49	58	41
36	41	52
48	36	53
49	25	46
41	13	34
97	34	20

10	60	60
°	'	"
49	17	59
57	20	41
49	36	34
31	44	29
47	51	50
61	54	39
47	41	23
53	37	41
43	20	50

QUESTIONS to exercise ADDITION.

1. If a Person was born in the Year 1709, when will he be 59 Years old?
2. A Lease was granted in the Month of *May*, 1439, and was to continue 217 Years: In what Year did it cease?
3. *A.* paid *B.* 372*l.* 12*s.* 2½*d.* and is still indebted to *B.* 611*l.* 17*s.* 9½*d.* What was the first Debt?
4. *A.* owes me 17*l.* 10*s.* 6*d.* *B.* 5*l.* 11*s.* 9*d.* and *C.* 9*l.* 11*s.* 7¼*d.* How much is due to me in all?
5. A Merchant hath 4 Bags of Hops, the first weighs 1*C.* 3*qr.* 12*lb.* and each of the rest weighs 15*lb.* more: What Quantity hath he in the Whole?
6. A Person had eight Chests of Tea, two of which weighed 4*C.* 2*qr.* 1*lb.* each, and the rest weighed 17 Pounds more: What Quantity of Tea had he?
7. A Person saved in one Year 17 Guineas and Ninepence Halfpenny, and seven Years after he saved 19*l.* 1 Moidore, and 4¼*d.* What had he saved in the whole?
8. A Steward receives the following Sums of his Lord to pay the following Bills; 109*l.* 11*s.* 6*d.* to the Butcher; 90*l.* to the Baker; and 300*l.* 19*s.* 9*d.* to the Wine Merchant; and 60*l.* 11*s.* to pay the Servants Wages; I demand what he received in all?

OF SUBTRACTION.

SUBTRACTION teaches to take a small Number from a greater, and to know the true and exact Remainder or Difference betwixt them, of which there are two Sorts, Simple and Compound.

OF SIMPLE SUBTRACTION.

Simple Subtraction shews the Difference between any two Numbers of the same Denomination, as the Difference between seven Pounds and three Pounds is four Pounds.

GENERAL RULE.

If the lower Number be lesser than the upper, set the Excess underneath; but if the lower Number be greater than the upper, take the lower Number from the Number

16 Subtraction.

ACCOMPTANT'S

which you borrow, and to that Difference add the upper Number, carrying one to the next lower Place.

Proof, Add the Difference and lesser Sum together, and the Product will be equal to the greater Sum, when the Operation is right.

Note, The Numbers placed over the Sums shew at what you borrow, as they did in Addition at what you carried.

EXAMPLES.

£ 10	£ 10	£ 10	£ 10	£ 10
From 46140	147411	262720	414702	5242634
Take 12987	121928	140971	329876	4179828
<u>Rem.</u>				

Years 10	Crowns 10	Yards 10	Hours 10
426836	4724243	72234232	43624362
238467	1293292	32987658	12987649
<u></u>	<u></u>	<u></u>	<u></u>

OF COMPOUND SUBTRACTION.

Compound Subtraction shews the Difference between any two Sums of divers Denominations.

OF MONEY.

EXAMPLES.

10 20 12 4	10 20 12 4	10 20 12 4	10 20 12 4
£. s. d.	£. s. d.	£. s. d.	£. s. d.
Lent 71 10 6 $\frac{1}{2}$	412 10 6 $\frac{1}{2}$	71 11 9 $\frac{1}{2}$	27 12 2 $\frac{1}{4}$
Recd. 28 11 9 $\frac{3}{4}$	193 12 9 $\frac{3}{4}$	23 10 6 $\frac{3}{4}$	18 17 9 $\frac{1}{2}$
<u>Due 42 18 8$\frac{3}{4}$</u>	<u></u>	<u></u>	<u></u>

Dif.

COMPANION.

Subtraction. 17

	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.
Disbd.	24	12	2 $\frac{1}{4}$	523	12	7 $\frac{1}{2}$	522	13	7 $\frac{1}{2}$	433	12	6 $\frac{1}{2}$
Recd.	11	15	9 $\frac{1}{2}$	429	12	9 $\frac{3}{4}$	398	13	9 $\frac{3}{4}$	328	13	9 $\frac{3}{4}$
Bal.												

	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.
Borrd.	72	17	3 $\frac{1}{2}$	523	10	10 $\frac{1}{2}$	1000	0	0	400	13	6
Paid	19	18	7 $\frac{1}{4}$	100	12	10	---	---	---	233	13	9 $\frac{3}{4}$
Unpd.												

	£.	s.	d.		£.	s.	d.
Borrowed —	741	10	6 $\frac{1}{2}$	Received —	714	16	5 $\frac{1}{2}$
Paid at several Payments {	47	11	7 $\frac{1}{2}$	Laid out at fundry times {	47	11	3 $\frac{1}{4}$
	41	10	6 $\frac{3}{4}$		49	10	6 $\frac{1}{2}$
	19	19	7 $\frac{1}{2}$		49	11	11 $\frac{3}{4}$
	46	11	6 $\frac{3}{4}$		67	13	10 $\frac{1}{2}$
	56	17	1 $\frac{1}{4}$		41	19	11 $\frac{3}{4}$
	92	19	9 $\frac{1}{2}$		41	10	10
	41	11	11 $\frac{3}{4}$		72	6	11
Paid in all —				Laid out in all —			
Remains due				In hand —			

First, TROY WEIGHT.

	10	20	24	10	20	24	10	12	20	24
	Oz.	dwt.	gr.	Oz.	dwt.	gr.	lb.	oz.	dwt.	gr.
Bought	41	10	11	471	10	6	423	10	14	10
Sold —	19	11	12	121	11	7	228	10	14	20
Unfold										

18 Subtraction.

ACCOMPTANT'S

Second, AVOIRDUPOIS WEIGHT.

	10	20	4	28		10	20	4	28		10	20	4	28	16	16
	T.	C.	q.	lb.		T.	C.	q.	lb.		T.	C.	q.	lb.	oz.	dr.
From	23	10	1	20		74	13	2	23		73	10	2	23	10	6
Take	19	12	3	12		39	13	3	24		33	11	2	23	13	9

Differ.

Third, APOTHECARIES WEIGHT.

	10	8	3	20		10	8	3	20		10	12	8	3	20
	3	3	3	gr.		3	3	3	gr.		lb.	3	3	3	gr.
From	44	3	2	17		43	2	2	13		73	2	0	1	12
Take	25	3	2	10		24	3	2	19		32	4	2	2	18

Rem.

Fourth, CLOTH MEASURE.

	10	4	4		10	4	4		10	5	4		6	4
	yds.	qr.	nl.		yds.	qr.	nl.		ells.	qr.	nl.		f.a.	qr.
A Draper	bt.	423	2	2		733	2	2		433	2	2		832
Sold	—	122	3	3		393	3	3		232	3	3		734
Unfold														

Fifth, DRY MEASURE.

	10	36	4		10	36	4	2		10	36	4	2
	ch.	bu.	p.		ch.	bu.	p.	g.		ch.	bu.	p.	g.
From	722	20	2		412	12	2	1		714	10	2	1
Take	322	13	2		120	13	3			128	13	3	0

Diff.

Sixth, LONG MEASURE.

	10	8	40		10	3	12	3		10	3	8	40
	ms.	f.	p.		yd.	ft.	in.	b.c.		l.	m.	f.	p.
From	42	1	10		41	1	10	1		47	1	5	30
Take	19	2	13		12	2	11	2		18	2	2	21

Diff.

Seventh,

Seventh, SQUARE MEASURE.

	10	4	40		10	4	40		10	4	40
	a.	r.	p.		a.	r.	p.		a.	r.	p.
Bought	423	2	23		723	2	30		532	3	33
Sold	287	3	12		238	2	33		128	3	39
Unfold											

Eighth, WINE MEASURE.

	10	4	2		10	4	63	4		10	4	63	4	2
	g.	q.	p.		t.	b.	g.	q.		t.	b.	g.	q.	p.
Bought	14	3	1		534	2	34	2		412	1	39	2	1
Sold	17	2	0		128	3	34	3		124	2	30	3	0
Unfold														

Ninth, WINCHESTER MEASURE.

	10	54	4		10	4	9		10	4	8
	b.	g.	q.		b.	f.	g.		a.b.	f.	g.
From	433	30	2		47	1	2		41	2	1
Take	128	23	3		19	2	3		19	3	2
Diff.											

Tenth, TIME.

	10	13	4	7		10	7	24	60	60		10	24	60	60
	y	m.	av.	d.		av.	d.	b.	m.	s.		d.	b.	m.	s.
From	711	10	1	6		411	5	17	19	22		411	12	17	31
Take	128	12	1	0		128	6	19	21	36		129	12	17	48
Diff.															

Eleventh, MOTION.

	10	60	60		10	60	60		10	60	60
	o	i	u		o	i	u		o	i	u
From	56	21	10		71	19	13		471	10	21
Take	51	29	42		27	48	52		228	22	39
Diff.											

QUESTIONS to exercise SUBTRACTION.

1. The Battle of *Bosworth*, in *Leicestershire*, was fought betwixt *Richard* the Third and the Earl of *Richmond*, in the Year 1485, when *Richard* was defeated and slain: It happened 419 Years after *William* the Conqueror began to reign. In what Year did the Conqueror begin to reign, and how long is it since the Death of *Richard*, this being the Year 1765?

2. A Person bought an Estate, valued at 4222*l.* 9*s.* 6½*d.* and his Cash is, 2522*l.* 2*s.* 6½*d.* What Sum will he want to pay for the Estate?

3. What Sum of Money added to 374*l.* 17*s.* 11½*d.* will make one Thousand Pounds?

4. A Gentleman had two Sons; to the eldest he left 7846*l.* 19*s.* 11*d.* and to the youngest 2974*l.* 11*s.* 6*d.* Now a Relation has a mind to make the youngest Son's Fortune equal to that of the eldest; what Sum must he give him?

5. A Merchant was indebted to several Persons 29472*l.* 17*s.* but his Effects were valued at no more than 10,000*l.* what Sum will he want to pay the said Debts?

6. What Sum is that, which taken from 100*l.* leaves 37*l.* 11*s.* 4½*d.*?

7. Two Persons speaking of their Money, one said he had 11761*l.* 11*s.* 9*d.* and the other had 111000*l.* what was the Difference betwixt them?

8. A Gentleman upon his going out of Town, is informed by his Steward, that his Baker's Bill amounts to 47*l.* 11*s.* 9*d.* his Butcher's to 411*l.* 19*s.* 11½*d.* his Brewer's to 100*l.* his Cornchandlers to 114*l.* 11*s.* 9*d.* his Draper's to 100 Guineas, and his Coachmaker's to 50; I demand what Money he must send to his Banker for, he having but 70*l.* 11*s.* 9*d.* in Hand?

MULTIPLICATION,

IS a Rule, by which we find the Increase or Amount of any Number, being so many Times taken as there are Units in another Number; and this Increase, or Amount, is called the Product, the Rectangle, or the Plain; and the two Numbers producing are called the Factors, or one the Mul-

Multiplicand, and the other the Multiplier. There are two Sorts of Multiplication, *viz.* Simple and Compound.

OF SIMPLE MULTIPLICATION.

Simple Multiplication is the Multiplying of any two Numbers together, without Regard to their Signification; as 6 Times 6 is 36.

Proof, The common Method of proving Multiplication is by casting out the Nines, but the surest Way is by inverting the Factors, or by dividing the Product by the Multiplicand; and the Quotient will be the Multiplier.

N. B. The following Table must be learnt by Heart before you can proceed any farther;

The MULTIPLICATION TABLE.					
3 times	3 is 9	5 times	5 is 25	11 times	3 is 33
	4—12		6—30		4—44
	5—15		7—35		5—55
	6—18		8—40		6—66
	7—21		9—45		7—77
4 times	8—24	6 times	6 is 36	12 times	8—88
	9—27		7—42		9—99
			8—48		
			9—54		3 is 36
					4—48
	4 is 16	7 times	7 is 49		5—69
	5—20		8—56		6—72
	6—24		9—63		7—84
	7—28		8 is 64		8—96
	8—32		9—72		9—108
	9—36	8 times			
		9 times	9 is 81		

SECTION I.

Observe always that the Factors be placed one under another; that Units may stand under Units, Tens under Tens, &c.

Ex.

E X A M P L E S.

Pounds.
 Multiply 2714 This is called the Multiplicand.
 By ——— 2 This the Multiplier
 ———
 £. 5428 This the Product.

<i>Guineas.</i>	<i>Crowns.</i>	<i>Minutes.</i>	<i>lb.</i>
4746341	456741	5222622	4745226
4	5	6	7
————	————	————	————
————	————	————	————

479644	1147196	1474161	4976141
8	9	11	12
————	————	————	————
————	————	————	————

S E C T I O N II.

When the Multiplier consists of more Figures than one, there must be as many Products as there are Figures in the Multiplier, the first Figure of every Product must be put under its Multiplier; then add all these Products together, and their Sum will be their total Product required.

E X A M P L E S.

<i>£.</i>	<i>Yds.</i>	<i>pence</i>	<i>hrs.</i>
13271	6715	54326	23456
13	15	78	87
————	————	————	————
172523	100725	4237428	2040672
————	————	————	————

<i>days.</i>	<i>months.</i>	<i>years.</i>
579467	9161411	4746141
474	679	768
————	————	————
274667358	6220598069	3645036288
————	————	————

letters.

<i>letters.</i>	<i>books.</i>	<i>quarters.</i>
4768411	59471411	6497141
987	4917	4976
4706421657	292420927887	32329773616
 <i>days.</i>	 <i>minutes.</i>	
3619874	4497461	
49764	56789	
180139409736	255406312729	

Note, That when the Multiplier is above 12 and under 20, multiply by the unit Figure in your Multiplier, and as you multiply, add that to the Product of each single Figure that of the Multiplicand which stands next on the right Hand.

SECTION III.

Observe in the following Examples, that such Factors as have Cyphers at the Ends must be put under one another, as if there were no Cyphers.

To multiply by 10, is only placing a Cypher to the right Hand of the Multiplicand; and if you was to multiply by 100, you place two Cyphers, &c. so that to multiply by Unity, with any Number of Cyphers annexed, is only joining the Cyphers to the right Hand of the Multiplicand.

The Cyphers placed at the End of both or either of the Factors are not to be observed till the last Product, and then the Number of Cyphers, which are annexed in both Factors, must be placed to it.

EXAMPLES.

5714140	369744	4741411
10	100	1000

597160

24 *Multiplication.*

$$\begin{array}{r} 597100 \\ 890 \\ \hline \end{array}$$

$$\begin{array}{r} 531419000 \\ \hline \end{array}$$

$$\begin{array}{r} 4714000 \\ 197000 \\ \hline \end{array}$$

$$\begin{array}{r} 928658000000 \\ \hline \end{array}$$

ACCOMPTANT'S

$$\begin{array}{r} 5116000 \\ 19000 \\ \hline \end{array}$$

$$\begin{array}{r} 97204000000 \\ \hline \end{array}$$

$$\begin{array}{r} 94811000 \\ 791000 \\ \hline \end{array}$$

$$\begin{array}{r} 74837301000000 \\ \hline \end{array}$$

SECTION IV.

Observe that the Cyphers which stand between the Figures in the Multiplier, must be placed down under themselves, and then proceed to multiply by the Figure which stands next to them on the left Hand; let there be what Number of Cyphers soever in your Multiplier, put them down in the same Manner under themselves.

$$\begin{array}{r} 4790764 \\ 17904 \\ \hline \end{array}$$

$$\begin{array}{r} 85773838656 \\ \hline \end{array}$$

$$\begin{array}{r} 56784471 \\ 40907 \\ \hline \end{array}$$

$$\begin{array}{r} 2322882355191 \\ \hline \end{array}$$

$$\begin{array}{r} 47461411 \\ 400967 \\ \hline \end{array}$$

$$\begin{array}{r} 19039459584437 \\ \hline \end{array}$$

$$\begin{array}{r} 90640741 \\ 490706 \\ \hline \end{array}$$

$$\begin{array}{r} 44477955453146 \\ \hline \end{array}$$

SECTION V.

Observe that when the Number in your Multiplier is such that any two Figures being multiplied together, will make that Number, then multiply by one of those Figures, and that Product by the other, as 6 times 4 is 24.

EXAMPLES.

$$\begin{array}{r} 87465 \\ 24 \\ \hline \end{array}$$

$$\begin{array}{r} 2099160 \\ \hline \end{array}$$

$$\begin{array}{r} 7642854 \\ 45 \\ \hline \end{array}$$

$$\begin{array}{r} 343928430 \\ \hline \end{array}$$

$$\begin{array}{r} 963542 \\ 56 \\ \hline \end{array}$$

$$\begin{array}{r} 53958352 \\ \hline \end{array}$$

$$\begin{array}{r} 483214 \\ 81 \\ \hline \end{array}$$

$$\begin{array}{r} 39140334 \\ \hline \end{array}$$

COM-

COMPOUND MULTIPLICATION,

Or the Multiplication of Money, Weight, Measure, &c. is the multiplying of any Sum of diverse Denominations by one common Multiplier.

Rule, Multiply as in common Multiplication; only remember to carry one for every twelve in Pence, and one for twenty in Shillings, &c. as in Addition.

Proof by Division.

EXAMPLES.

$$\begin{array}{r}
 \text{4 lb. of Tea, at } \text{---} \quad \begin{array}{c} s. \quad d. \\ 8 \quad 4\frac{1}{2} \end{array} \text{ per lb.} \\
 \hline
 \text{£ 1 13 6 Facit.}
 \end{array}$$

6 Gallons of Rum at 6s. 8½d. per Gallon.

8 Hogsheads of Wine at 31l. 11s. 3d. per Hogshead.

9 Barrels of Ale at 10l. 11s. 0½d. per Barrel.

10 Yards of Silk at 13s. 11d. per Yard.

11 Watches at 5l. 5s. 10d. per Watch.

12 Sashes at 1l. 1s. 11d. per Sash.

SECTION I.

When the Multiplier is above twelve, you must multiply the given Price by any two Factors, which, when multiplied together, will produce the given Number. As suppose the given Factor is 24, you must multiply by 6 and by 4, or by 8 and by 3; they both answering the same End.

EXAMPLES.

		l.	s.	d.
14 Yards of Cloth at 7s. 6d. ½ per Yd.	Facit	5	5	7
20 Yards of Lace at 10s. 11d. ½ per Yd.	Facit	10	19	2
28 Ells of Silk at 14s. 7d. per Ell,	Facit	20	8	4
36 Gallons of Oil at 17s. 11d. ¾ per Gal.	Facit	32	7	3
48 Yds of broad Cloth at 19s. 11d. ½ per Yd.	Facit	47	18	0
60 Yards of Lace at 11s. 11d. ½ per Yd.	Facit	35	17	6
66 Bushels of Corn at 13s. 11d. ½ per B.	Facit	46	1	3
77 Firkins of Butter at 19s. 10d. ¾ per F.	Facit	76	11	11½
	D			88

	<i>l.</i>	<i>s.</i>	<i>d.</i>
88 Gallons of Rum at 10s. 11d. $\frac{1}{2}$ per Gal. <i>Facit</i>	48	4	4
93 Barrels of Ale at 1l. 1s. 2d. per Bar. <i>Facit</i>	95	5	0
99 Barrels of Soap at 2l. 11s. 9d. per B. <i>Facit</i>	256	3	3
132 Hhds. of Beer at 14l. 6s. 7d. per H. <i>Facit</i>	189	9	0
144 Yards of Lace at 3l. 11s. 6d. per Yd. <i>Facit</i>	514	16	0

SECTION II.

When the given Multiplier is such, that when two Numbers are multiplied together they will not produce it, you must take any two Factors, which when multiplied together will come nearest the Multiplier; as suppose the given Number is 58, you must multiply by 8 and by 7, and the given Price by 2, and add it to the last Product.

EXAMPLES.

	<i>l.</i>	<i>s.</i>	<i>d.</i>
39 Yards of Silk at 14s. 7d. $\frac{3}{4}$ per Yd. <i>Facit</i>	28	9	6 $\frac{3}{4}$
47 Yards of Lace at 1l. 19s. 6d. per Yd. <i>Facit</i>	92	16	6
51 Barrels of Ale at 2l. 11s. 6d. $\frac{1}{2}$ per B. <i>Facit</i>	131	8	7 $\frac{1}{2}$
91 Butts of Ale at 11l. 11s. 6d. per Butt <i>Facit</i>	1053	6	6
107 Yards of Lace at 1l. 13s. 6d. per Yd. <i>Facit</i>	179	4	6
143 Hhds. of Beer at 4l. 11s. 6d. per H. <i>Facit</i>	654	4	6

SECTION III.

When the Multiplier is above 144 you must take the Parts (thus) Suppose the given Number is 228, you must multiply the given Price by 10, which will produce the Price of 10; and that product multiply by 10 also, which is the Price of 100; then multiply the Price of 100 by 2, which will be the Price of 200; then for the 28, you must multiply the Price of 10 by 2, and place it under the last Product; and lastly, the given Price by 8, and place it under the last Product; add all three together, and the Product will be the Price of 228 as required: Observe the same Method in the following Examples.

	<i>l.</i>	<i>s.</i>	<i>d.</i>
211 Yards of Lace at 17s. 9d. $\frac{1}{2}$ per Yd. <i>Facit</i>	187	14	0 $\frac{1}{2}$
196 Yards of Cloth at 18s. 11d. $\frac{1}{2}$ per Yd. <i>Facit</i>	185	15	10
391 Firkins of Butter at 14s. 7d. per F. <i>Facit</i>	285	2	1
476 Barrels of Beer at 2l. 11s. 9d. per B. <i>Facit</i>	1231	13	0
513 Watches at 5l. 7s. 9d. per Watch. <i>Facit</i>	2763	15	9

698 Oaks at 7*l.* 11*s.* 9*d.* per Oak *Facit* 5296 1 6
 998 Cwt. of Brass at 5*l.* 11*s.* 6*d.* per Cwt. *Facit* 5563 17 0

SECTION IV.

In the Multiplying of Weights, Measures, &c. all that is to be observed, is to stop as in Addition, viz. One for every 28 at Pounds, one for every 4 in Qrs. &c. &c.

EXAMPLES.

	10	12	20	24					
	<i>lb. oz. dwts. gr.</i>					<i>lb. oz. dwts. gr.</i>			
Multiply	2	4	15	12	by 4	<i>Facit</i>	13	7	3 0
	10	20	4	28	16				
	<i>t. C. q. lb. oz. dr.</i>					<i>t. C. q. lb. oz. dr.</i>			
Multiply	2	8	1	0	14	6 by 8	<i>Facit</i>	19	6 0 7 3 0
	10	12	8	3	20				
	<i>lb. 3 3 3 gr.</i>					<i>lb. 3 3 3 gr.</i>			
Multiply	12	4	5	1	12	by 13	<i>Facit</i>	161	0 7 2 16
	10	4	4						
	<i>yd. qr. na.</i>					<i>yd. qr. na.</i>			
Multiply	44	1	3		by 15	<i>Facit</i>	666	2	1
	10	36	4	2	4				
	<i>c. b. p. g. q.</i>					<i>c. b. p. g. q.</i>			
Multiply	16	12	2	1	1	by 19	<i>Facit</i>	310	24 1 1 3
	10	3	8	40					
	<i>l. m. f. p.</i>					<i>l. m. f. p.</i>			
Multiply	57	1	6	19	by 28	<i>Facit</i>	1600	4 2 5 12	
	10	3	12	3					
	<i>yds. f. in. bc.</i>					<i>yds. f. in. bc.</i>			
Multiply	41	1	10	1	by 73	<i>Facit</i>	3004	8 0 10 1	
	10	4	40						
	<i>a. r. p.</i>					<i>a. r. p.</i>			
Multiply	27	3	17		by 26	<i>Facit</i>	724	1	2
	10	4	63	4					
	<i>t. b. g. q.</i>					<i>t. b. g. q.</i>			
Multiply	18	2	22	1	by 71	<i>Facit</i>	1319	3 4 3	
	10	54	4						
	<i>b. g. q.</i>					<i>b. g. q.</i>			
Multiply	16	19	1		by 94	<i>Facit</i>	1537	27 2	
	10	13	4	7	24	60	60		
	<i>y. m. w. d. h. m. s.</i>					<i>y. m. w. d. h. m. s.</i>			
Multiply	41	10	1	6	23	17	11 by 23	<i>Facit</i>	9471 7 1 6 7 35 13
	10	60	60						
	0	1	"				0	1	"
Multiply	4	10	19		by 60	<i>Facit</i>	250	19	0



D I V I S I O N.

DIVISION is that by which we discover how many Times one Number (call'd the Divisor) is contain'd in another (call'd the Dividend) and the Answer is call'd the Quotient, in this there are three Things to be observed.

First, to seek,

Secondly, to multiply,

Thirdly, to subtract.

Sometimes after the last Subtraction there is a Remainder, which is always less than the Divisor, and of the same Name with the Dividend. There are two Sorts of Division *viz.* Simple and Compound.

The Proof of Division is made by multiplying the Quotient by the Divisor, and adding that Proof to the Remainder (if there be any) which produce the Dividend; or if you add all the separate Products made in the Course of your Division (by multiplying the Quotient by the Divisor) and the Remainder into one Sum, it will be the Dividend as I have marked the first Examples in Long-Division with this Mark ✓

Of SIMPLE DIVISION.

Simple Division is when the Divisor and Dividend are made Choice of, no Regard being had to their Signification; as 72 divided by 9 produces 8; which is as much as to say, 9 is contained 8 times in 72: there are likewise two kinds of Simple Division, *viz.* Short Division and Long Division.

Of SHORT DIVISION.

Short Division is only made use of when the Divisor does not exceed Twelve.

EXAMPLES.

Dividend	Quotient
Divisor 2)7161413(	3580706
4)7161411(	5)7161414(
1 Remainder	
6)7141611(	7)47151411(
8)7141614(	9)98765141(
10)7161417(	11)41719611(
12)71961471(	

Of

OF LONG DIVISION.

SECTION I.

It is called Long Division when the Divisor is above Twelve. Being obliged, for an Help to the Memory, to multiply by one single Figure at a Time, till you have multiplied the whole Divisor; (always beginning at the right Hand Figure) then you must subtract that Product from the Dividend to find the Remainder, and so must be continued to every Quotient Figure.

EXAMPLES.

Divide 3985 by 28,

$$\begin{array}{r} 28 \overline{) 3985} \quad 142 \\ \underline{28 } \\ 118 \\ \underline{112 } \\ 65 \\ \underline{56 } \\ 9 \end{array}$$

Remainder 9 ✓

3985 Proof

142 Quotient:
28 Divisor

$$\begin{array}{r} 1145 \\ \underline{284} \end{array}$$

3985 Proof

N. B. The Remainder 9 is brought in when I multiply by 28.

37)7419141(121)716121811(98765)41714123451(
48)9719121(276)319416141(79147)61417121612(
57)4191217(398)71612345(501716)47195121711(
68'41212345(976)412161239(2300761)519716141211(
79)7947161(1234)7141614211(987651)67841234561(
89)71914213(4371)4197171612(712137)4121711987651(

SECTION II.

When there are Cyphers annexed to the Divisor you must cut them off, and the same Number of Figures toward the right Hand in the Dividend must be cut off as there are Cyphers in the Divisor, and annexed to the Remainder at last.

Note, To divide by 10, 100 or 1000, &c. is only to cut off from the Dividend so many Figures toward the right Hand, as there are Cyphers in the Divisor; which will be a Remainder, and those on the left Hand of the Dividend will be the Quotient.

EXAMPLES.

1|00)71414|14(498|00)761414|71(
876|000)4971416|121(987|000)416141|000(

D 3

SEC

SECTION III.

When the Divisor is such that any two Figures being multiplied together will make that Divisor, then divide by one of those Figures and that Product by the other, as 4 times 6 is 24.

EXAMPLES.

$$24)381428| \quad 45)3817689| \quad 56)29856943|$$

OF COMPOUND DIVISION.

Compound Division, is the dividing divers Denominations by one common Divisor.

You must divide as in Short Division, only remembering to carry as you did in Addition.

EXAMPLES.

10 20 12 4	10 12 20 24	10 4 28 16 16
<i>£. s. d.</i>	<i>lb. oz. dw. gr.</i>	<i>C. q. lb. oz. dr.</i>
7)91 11 7 $\frac{1}{2}$ (	8)71 10 11 10(	9)10 1 10 1 3
10 12 8 3 20	10 4 4	10 36 4
<i>lb. 3 3 3 gr.</i>	<i>yd. qr. nl.</i>	<i>c. b. p.</i>
11)47 10 1 1 17(	7)411 1 1(	7)31 10 1(
10 8 40	10 54 4	10 13 4 7 24 60
<i>m. f. p.</i>	<i>b. g. q.</i>	<i>y. m. w. d. h. m.</i>
6)411 1 36(	6)16 10 1(	12)41 1 1 1 6 10(

QUESTIONS to exercise DIVISION.

1. Divide 150*l.* among 50 Sailors.
2. If 90*l.* be divided among 60 Men, how much a piece?
3. A Captain took a Prize worth 20,000*l.* the one-third Part belonged to him, the rest to be equally divided among the Sailors which were 180 in Number: What's each Man's Share?
4. Suppose at the taking of *Quebec*, Anno. 1759, there were 1000 Soldiers, and the Plunder of the City amounted to 3196*l.* What's each common Man's Share, supposing there were 56 Officers, and they were to have 20*l.* each out of it?
5. A certain Number of Persons (belonging to a Lottery Society) purchased Tickets to the Amount of 195*l.* of which each Person paid 5*l.* I demand the Number of the Society?
6. What's the Quotient of 71614181 divided by 9 and by 8?
7. Suppose in the late Subscription for cloathing of 2112 Prisoners of War, 21611*l.* was subscribed: What's each Man's Share?

8. A Privateer with 70 Hands on Board having been out upon a Cruize, took a Prize valued at 7000*l*. What's each Man's Share?

OF REDUCTION.

REDUCTION teaches how to bring a Number from one Denomination to another of the same Value, which is performed by Multiplication and Division; and there are likewise two Sorts of Reduction, *viz.* Reduction Descending and Ascending.

I. REDUCTION DESCENDING,

Is performed by Multiplication, as when great Names are to be brought into small; as Shillings into Pence, or Pounds into Ounces, &c.

Proof. By changing their Order.

OF MONEY.

EXAMPLES.

1. In 31 Pounds, how many Shillings, Pence and Farthings?

31*l*.

20 Shillings in one Pound

620 Shillings in 31 Pounds

12 Pence in one Shilling

7440 Pence in 31 Pounds

4 Farthings in one Penny

29760 Farthings in 31 Pounds

2. In 70 Crowns, how many Shillings, Pence and Farthings? *Answer* 350 Shillings, 3000 Pence, 12000 Farthings.

3. Reduce 70 Guineas into Three-pences. *Ans.* 5880 Three-pences.

4. Reduce 29*l*. 6*s*. into Groats. *Ans.* 1758 Groats.

5. In 50*l*. 11*s*. 6*d* how many Shillings and Two-pences? *Ans.* 1011 Shillings, 6066 Twopences.

6 In 376*l*. 17*s*. 11*d* $\frac{1}{2}$, how many Farthings? *Ans.* 361822 Farthings.

7 How many Farthings are equal in Value to one thousand Pounds? *Ans.* 960000 Farthings. 8.

8. In 976 Guineas, 19s. and 7d $\frac{1}{2}$. how many Farthings? *Ans.* 984750 Farthings.

9. In 372 Moidores, 14s. 9d $\frac{1}{2}$ how many Farthings? *Ans.* 482822 Farthings.

10. Change 7164 Marks into Farthings. *Facit* 4584960.

11. In 6742 Half-Crowns, how many Farthings? *Ans.* 809040.

12. In 700 Guineas, how many Pence? *Ans.* 176400.

13. In 500 Crowns, how many Farthings? *An.* 120000.

14. How many Farthings in 2746 Nobles? *Ans.* 878720

15. In 2146 Pieces of Eight, each being in Value 4s. and 6d. How many Farthings? *Ans.* 463536.

16. How many Farthings are equal in Value to 376 Three Pound Twelves, 17s. and 9d? *Ans.* 1300308.

2. REDUCTION ASCENDING,

Is performed by Division, as when small Names are to be brought into great, as Farthings into Pounds, &c. it being quite the reverse of Reduction Descending.

EXAMPLES.

1. In 29760 Farthings, how many Pence, Shillings and Pounds?

$$\begin{array}{r} 4 \overline{) 29760} \end{array}$$

$$\begin{array}{r} 12 \overline{) 7440} \text{ Pence.} \end{array}$$

$$\begin{array}{r} 2 \overline{) 620} \text{ Shillings.} \end{array}$$

$$\begin{array}{r} 31 \text{ Pounds.} \end{array}$$

Note, This is the Proof of the first Question in Reduction Descending.

2. In 12000 Farthings, how many Crowns? *Ans.* 70 Crowns.

3. In 5880 Threepences, how many Guineas? *Ans.* 70 Guineas.

4. In 1758 Groats, how many Pounds. *Ans.* 29l. 6s.

5. In 6066 Twopences, how many Pounds. *Ans.* 50l. 11s. 6d.

6. In 40006 Pence, how many Guineas? *Ans.* 158 Guineas 15s. 10d.

7. Change 10000 Farthings into Moidores. *Facit* 7 Moidores, 19s. 4d.

8. In 7116 Pence, how many Three Pound Twelves? *Ans.* 8 and 17s. over.

9. In 2116 Shillings, how many Three Pound Twelves?
Answ. 29 and 28s. over.

10. Change 216171 Halfpence into Crowns. *Facit*
 1801 2s. 1d $\frac{1}{2}$.

11. How many Pounds and Shillings are there in 7161 Farthings. *Answ.* 7l. 9s. 2d. $\frac{1}{4}$.

12. Change 51617 Half Crowns into Pounds. *Facit*
 6452l. 2s. 6d.

13. Change 3141 Pence into Crowns. *Facit* 52l. 1s. 9d.

14. In 700 Shillings, how many Crowns and Pounds?
Answ. 140 Crowns and 35 Pounds.

15. How many Crowns are there in 1000 Farthings?
Answ. 4 Crowns and 10d. over.

16. In 878720 Farthings, how many Nobles? *Answ.* 2746.

REDUCTION ASCENDING and DESCENDING.

Is performed both by Multiplication and Division.

EXAMPLES.

1. In 462 Crowns, how many Shillings and Pounds?
Answer 2360 Shillings, 118 Pounds

472 Crowns.

$$\begin{array}{r} 5 \\ \hline 2 \overline{) 0236} \overline{) 0} \end{array}$$

118 Pounds.

2 In 946 Shillings, how many Pence and Crowns?
Answ. 11352d. 189 Crowns and 1s. over.

3. In 548 Half Crowns, how many Crowns and Pence?
Answ. 274 Crowns, 16440d.

4. In 60 Pounds, how many Shillings and Crowns?
Answ. 1200s. 240 Crowns.

5. In 500 Crowns, how many Shillings and Guineas?
Answ. 2500s. 119 Guineas 1s. over.

6. In 50 Guineas, how many Shillings and Pounds?
Answ. 1050s. 52l. 10s.

7. In 8140 Pence, how many Shillings, Crowns and Farthings?
Answ. 678s. 4d. 135 Crowns 3s. 4d. 32560 Farthings.

8. How many Groats, Pence and Crowns are in 846 Shillings?
Answ. 2538 Groats, 10152 Pence, and 169 Crowns 1s. over.

9. Reduce 80l. into Shillings, Guineas and Pence.
Facit 1600s. 76 Guineas 4s. 19200d.

10. In 700 Groats, how many Shillings, Pence and Crowns? *Ans.* 233s. 4d. 2800d. 46 Crowns, 3s. 4d.

11. In 70 Moidores, how many Guineas? *Ans.* 90 Guineas.

12. How many Guineas, Crowns, Pence and Threepences are there in 50l? *Ans.* 47 Guineas 13s. 200 Crowns, 12000d. 4000 Threepences.

13. How many Sixpences, Groats and Guineas are in 20 Moidores? *Ans.* 1080 Sixpences, 1620 Groats, 25 Guineas and 15s. over.

14. Reduce 70 Three Pound Twelves into Guineas, Pounds, Shillings and Crowns. *Facit* 240 Guineas, 252l. 5040s. 1008 Crowns.

15. Reduce 1596 Pence into Shillings, Groats and Crowns, and the Number of each equal. *Facit* 21.

16. *Cape Breton* was taken by the *English* Anno 1759, at the siege of which we will suppose there were 5116 Soldiers, and the Plunder of the City amounted to 3000l. What is each common Man's Share, supposing there were 30 Officers, and they were to have 10l. each out of it? *Ans.* 10s. 6d. $\frac{1}{2}$ each Man.

17. A Gentleman distributed 60l. among 40 poor House-keepers, 13 of which were to have a Guinea each, and 14 of them one Guinea and a half each; and the Remainder was to be equally divided amongst the rest; What is each Share? *Ans.* 1l. 17s. 4d. $\frac{1}{2}$ each.

OF TROY WEIGHT.

1. In 11lb. 10oz. 11dwts. how many Grains? *Ans.* 68424 Grains.

2. In 21000 Grains of Silver, how many lb? *Ans.* 3lb. 7oz. 15dwt.

3. In 3lb. 10oz. of Gold, how many Ear-rings, each 10dwts? *Ans.* 92 ear-rings.

4. In 10 Ingots of Silver, each 17oz. 10dwts. how many lb? *Ans.* 14lb. 7oz.

5. In 19lb. of Silver, how many Buckles, each 10oz. and an half? *Ans.* 21 Buckles, and 150 dwts. over.

6. A Gentleman having 36lb. 10oz. of Silver, was minded to make it into Spoons of 3oz. each; how many must he have? *Ans.* 147 Spoons, and 10oz. over.

A VOIR DUPOIS WEIGHT.

1. How many Pounds are there in 5C. 3qs. 17lb. of Sugar? *Answ.* 661lb.
2. How many Hundreds, Quarters and Pounds are there in 4 Tons of Iron. *Answ.* 80C. 320qs. 8960lb.
3. In 9C. 0qs. 11lb. how many Oz. and Drams? *Answ.* 163040z. 260864 ds.
4. In 17465 Ounces, how many Hundreds, Quarters and Pounds? *Answ.* 9C. 2qs. 27lb.
5. In 98463 Pounds of Iron, how many Tons? *Answ.* 21 Tons, 12C. 2qs. 23lb.
6. In 9 Tons of Iron, how many Half Hundreds, Quarters and Pounds, and of each an equal Number? *Answ.* 237 and 15lb.
7. How many common Pounds of Silk are there in 570 great lb? *Answ.* 855.
8. How many great Pounds of Silk are there in 753 common Pounds? *Answ.* 502lb.
9. How many Oz. and Drams in 342 common Pounds of Silk? *Answ.* 54720z. and 87552 ds.
10. How many great Pounds of Silk in 29785 Drams? *Answ.* 77lb. 130z. 9ds.
11. How many Parcels, each 70z. are there in 14lb. of Cloves? *Answ.* 32 Parcels.
12. How many Pounds in 7 Hhds. of Tobacco, each weighing neat 9 C 2qs. 11lb? *Answ.* 7525lb.
13. In 914 C of Lead, how many Fodder? *Answ.* 46 Fodder 17 C.
14. How many Fodders of Lead in 19 Pigs, each weighing 3 C 3qs. 17lb? *Answ.* 3 Fodders, 15 C. 2qs. 15lb.
15. A Grocer having 19 C. 3qs. 17lb. of Sugar to make into parcels of 14lb. 12lb. and 9lb. and of each an equal Number, how many must he have? *Anf.* 63 Parcels, 24lb.

Note. There are two sorts of Pounds used in weighing of Silk, viz. great Pounds and common Pounds; as all Raw, all Short, Long China and Morea Silk, &c. are weighed by the great Pound of 24 oz. But Sleeve Silk, Ferret, Filofella, &c. by the common Pound of 16 oz.

To reduce common Pounds into great, multiply by 2, and divide by 3.

To reduce great Pounds into common, multiply by 3, and divide by 2.

APOTHECARIES WEIGHT.

lb. 3 3 9 grs.

1. How many Grains are there in 9 7 3 1 14? *Ans.* 55414 Grains.

2. How many *lb. oz. dr. sc. gr.* are there in 74530 Grains?
lb. oz. dr. sc. grs.

Ans. 2 11 2 0 0.

lb. oz. dr. sc. grs.

3. A Chemist having 1 9 3 2 8 of Powder, was minded to make it into Medicines of 16 Grains each; how many must he have, supposing he was desirous of having an equal Number of each Sort? *Ans.* 644, and 4 *drs.* over.

CLOTH MEASURE.

1. How many Quarters and Nails are there in 40 Yards of Cloth? *Ans.* 160 *grs.* and 640 *nls.*

2. In 20 Pieces of Cloth, each 25 Yards, how many Quarters and Nails? *Ans.* 2000 *grs.* and 8000 *nls.*

3. In 400 Nails, how many Yards? *Ans.* 25 *yds.*

4. Reduce 4600 Ells of Holland, into Yards, Quarters and Nails. *Facit* 5750 *yds.* 23000 *grs.* 92000 *nls.*

5. In 3000 Nails, how many *English* and *Flemish* Ells? *Ans.* 150 *English* Ells, and 250 *Flemish* Ells.

6. In 70000 Nails, how many Bales, each 10 Pieces, each 20 Yards? *Ans.* 21 Bales, 8 Pieces, 15 Yards.

7. In 70 Bales of *Smyrna* Silk, each 11 Pieces, each 30 Yards, how many *English* Ells, Quarters and Nails? *Ans.* 18480 *English* Ells, 92400 *grs.* 369600 *nls.*

DRY MEASURE.

1. How many Bushels and Pecks of Wheat are there in 36 Quarters? *Ans.* 288 *bsh.* 1152 *pkts.*

2. 1790 Pecks, how many Quarters of Barley? *Ans.* 55 *grs.* 7 *bshs.* 2 *pkts.*

3. How many Pecks in 42 Chaldron of Coals, each 36 Bushels? *Ans.* 6048 *pkts.*

4. How many Chaldron of Coals in 8790 Pecks? *Ans.* 61 *chald.* 1 *bshl.* 2 *pkts.*

LONG MEASURE.

1. In 90 Miles, how many Yards, Poles and Furlongs? *Ans.* 720 Furlongs, 28800 Poles, 158400 Yards.

2. In 190088 Barley Corns, how many Yards? *Ans.* 1760 Yards.

3. How many Miles and Leagues are in 964800 Inches?
Ans. 5 Leagues, 15 Miles, and 400 Yards over.

4. How many Feet, Inches, and Barly-Corns are there in 50 Yards? *Ans.* 150 Feet, 1800 Inches and 5400 Barley-Corns.

5. How many Inches will make a Mile in Length?
Ans. 63360 Inches.

6. How many Inches and Barly-Corns in 1 League?
Ans. 190080 Inches, 570240 Barly-Corns.

7. How often will a Wheel 17 Feet 6 Inches round turn in 100 Miles? *Ans.* $30171\frac{20}{100}$

8. How many times oftner will a Wheel that is 10 Feet 10 Inches round turn, than another that is 19 Feet 9 Inches, between London and Lincoln, taking the Distance at 120 Miles? *Ans.* 26405.

LAND (or square) MEASURE.

1. How many Roods and Perches are there in 20 Acres?
Ans. 80 Rood and 3200 Perches.

2. How many Perches are there in 11 Acres, 3 Roods, 17 Poles? *Ans.* 1897 Perches.

3. In 7890 Perches, how many Acres? *Ans.* 49 Acres, 1 Rood, 10 Perches.

4. A Farmer bought a Field that contained 14 Acres, 3 Roods, 7 Poles; but he was minded to take an Inclosure of 7 Acres out of it; how many Perches were there in the Remainder? *Ans.* 1247 Perches.

5. A Gentleman being desirous to inclose three Fields, the first containing 9 Acres 2 Roods, the second 11 Acres 1 Rood, 7 Poles, and the third 8 Acres, 1 Rood 12 Poles; how many Shares of 86 Perches each are contained in the Whole? *Ans.* 54 Shares, 15 Perches over.

LIQUID MEASURE.

1. In 46 Barrels of Ale, how many Gallons? *Ans.* 1472.

2. How many Gallons of Beer will a Copper contain that holds 18 Hogsheads? *Ans.* 972 Gallons.

3. How many Pipes of Wine are there in 7892 Gallons?
Ans. 62 Pipes, and 80 Gallons over.

4. How many Quarts, Pints and Half-pints are in 20 Gallon of Ale? *Ans.* 80 Quarts, 160 Pints, 320 Half-pints.

5. How many Gallons, Quarts and Pints are there in a Pipe of Wine? *Ans.* 126 Gallons, 504 Quarts, 1008 Pts.

6. How many Barrels of Beer are in 96 Hogsheads? *Ans.* 144 Barrels.

7. How many Gallons, Quarts and Pints are in two Buts and an half of Beer? *Ans.* 270 Gallons, 1080 Quarts, 2160 Pints.

8. In 700 Pints of Brandy, how many Half-Anchors? *Ans.* 8 Half-Anchors, 7 Gallons, 2 Quarts.

9. How many Gallons, Quarts and Pints are there in 7 Tuns of Oil? *Ans.* 1764 Gallons, 7056 Quarts, 14112 Pints.

10. In a Puncheon of Rum, how many Quarts and Pints, and of each an equal Number? *Answer* 224.

11. A Gentleman being minded to bottle off 2 Hogsheads of Mountain Wine, into Bottles of 2 Quarts, Quarts and Pints, and to have an equal Number of each; how many must he have? *Ans.* 144.

OF TIME.

1. How many Days are there in 708560 Seconds? *Ans.* 8 Days, 4 Hours, 49 Minutes, 20 Seconds.

2. How many Days, Hours and Minutes are there in three Months, each 30 Days? *Ans.* 90 Days, 2160 Hours, 129600 Minutes.

3. How many Minutes since the Birth of Christ, this being the Year 1760, accounting the common Julian Year? *Ans.* 925689600 Minutes.

4. In 789644 Minutes how many Weeks? *Ans.* 78 Weeks, 2 Days, 8 Hours, 44 Minutes.

5. In 365 Days, 6 Hours, (a Julian Year) how many Minutes and Seconds? *Answer* 525960 Minutes, 31557600 Seconds.

6. How many Days from April 10 to November 2? *Ans.* 205 Days.

OF MOTION.

The Sun makes its progress through the 12 Signs of the Zodiac, in a Year's Time, each Sign being 30 Degrees; in how many Minutes and Seconds doth she complete her Course? *Ans.* 21600 Minutes, 1296000 Seconds.

OF the SINGLE RULE OF THREE.

IN all Questions in this Rule there are three Terms propounded, viz. two of Supposition, and one of Demand;

mand ; that of Demand is always your third Number, and is known by these Words, *viz.* What cost ? What will ? How much ? How many, &c. and the Term of Supposition that is of the same Denomination with the Term of Demand, must be your first Number, and the other Term of Supposition your second Number.. The Single Rule of Three is comprehended under two Proportions, *viz.* Direct and Inverse.

OF DIRECT PROPORTION,

Teaches the Resolution of any Analogy or Proportion; that is, it shews how, by having three Numbers given, to find a fourth that shall bear the same Proportion to the third that the second doth to the first ; and is known when more requires more, and less requires less. When more requires more, is when the third Term is greater than the first ; therefore the fourth Term must be greater than the second ; but when less requires less, is when the third Term is less than the first, therefore the fourth Term is required to be less than the second.

Rule. After your Question is stated, multiply your second and third Numbers together, and divide that Product by the first, and the Quotient will be of the same Name as your middle Number, and the Answer to your Question.

Proof. By changing their Order.

EXAMPLES.

If 4 Yards of Cloth cost 2 *l.* 4 *s.* 4 *d.* what will 25 Yards of the same cost ?

$$\begin{array}{r}
 2\text{ l. } 4\text{ s. } 4\text{ d.} \\
 20 \overline{) } \\
 \underline{44} \text{ Shillings} \\
 12 \\
 \underline{532} \text{ Pence}
 \end{array}$$

Now the Question is fit for stating by this Reduction ; and will stand thus,

$$\begin{array}{r}
 \text{Yds.} \quad \text{d.} \quad \text{Yds.} \\
 \text{If } 4 \text{ — } 532 \text{ — } 25 \\
 25 \\
 \underline{2660} \\
 1064 \\
 \underline{4)13300}
 \end{array}$$

3325 Pence, and Answer to
E. 2 the

the Question; and by reducing the Pence into Pounds, &c. by Reduction Ascending, it will be found to be 13*l.* 17*s.* 1*d.*

2. If 5*lb.* of Sugar cost 20*d.* what cost 36*lb.*? *Ans.* 12*s.*

3. If 6 Yards of Cloth cost 14*s.* 2*d.* what will 64 Yards cost? *Ans.* 7*l.* 11*s.* 1 $\frac{1}{4}$ *d.* $\frac{2}{8}$.

4. I gave 19*l.* 16*s.* for 15 Sacks of Flour; what must I give for 50 Sacks? *Ans.* 66*l.*

5. If a Bushel of Coals cost 14*d.* what cost a Chaldron? *Ans.* 2*l.* 2*s.*

6. What will 4 $\frac{1}{2}$ Yards of Cloth cost when 32 Yards of the same comes to 7*l.* 9*s.* 10*d.*? *Ans.* 1*l.* 1*s.* 0 $d.\frac{3}{4}\frac{1}{2}$.

7. What comes a Puncheon of Rum to when the Anchor is sold for 5*l.* 15*s.* 6*d.*? *Ans.* 48*l.* 10*s.* 2 $\frac{1}{4}$ *d.* $\frac{6}{8}$.

8. If 4 Yards of Cloth cost 29*s.* what is the Value of 496 *Flemish* Ells? *Ans.* 134*l.* 17*s.*

9. How many Yards of Shalloon of $\frac{1}{2}$ Yard wide will be sufficient to line 7 Yards of Cloth that is 1 $\frac{1}{2}$ Yard wide? *Ans.* 21 Yards.

10. What will 2 Gallons of Wine amount to at the Rate of 24*l.* per Hogshead? *Ans.* 15*s.* 2 $\frac{3}{4}$ *d.* $\frac{1}{8}\frac{2}{3}$.

11. If 2 Yards of Cloth cost 14*s.* what cost 100 *English* Ells? *Ans.* 43*l.* 15*s.*

12. If a Person spends 4*l.* 15*s.* 1*d.* in 7 Days, how much is that in a Year? *Ans.* 245*l.* 5*s.* 9 $d.\frac{1}{4}\frac{1}{7}$.

13. What will one Hundred Weight of Sugar cost at the Rate of 2*s.* 9*d.* for 3*lb.*? *Ans.* 5*l.* 2*s.* 8*d.*

14. What cost 1 C. of Cheefe at 4 $\frac{1}{4}$ *d.* per *lb.* *Ans.* 1*l.* 19*s.* 8*d.*

15. A Grocer bought 3 C. of Rice for 3*l.* 10*s.* what did he give per *lb.*? *Ans.* 2 $\frac{1}{2}$ *d.*

16. If 4 Oz. of Silver cost 1*l.* 3*s.* what is the Price of a Coffee-pot that weighs 2*lb.* 5oz? *Ans.* 7*l.* 15*s.* 3*d.*

17. If 1 C. of Sugar cost 2*l.* 1*s.* 6*d.* what will 97 C. 3 *qrs.* 21*lb.* cost at that Price? *Ans.* 203*l.* 4*s.* 4 $\frac{3}{4}$ *d.* $\frac{5}{11}\frac{6}{12}$.

18. What will 1 $\frac{1}{4}$ Yard of Cloth cost when 25 $\frac{1}{2}$ Yards of the same comes to 7*l.* 9*s.* 11 $\frac{1}{2}$ *d.*? *Ans.* 7*s.* 4*d.* $\frac{8}{15}\frac{6}{12}$.

19. A Maltster laid out 25*l.* 10*s.* 6*d.* in Malt at the Rate of 3*s.* 4*d.* per Bushel; what Quantity did he buy in? *Ans.* 19 *Quarter*, 1 $\frac{6}{10}$ *Bushel*.

20. Admit a Tax of 2*s.* 11 $\frac{1}{2}$ *d.* per Pound is assessed upon a Parish for the Building of a Church; what must a Parishioner pay towards it whose House is rented at 150 *Guineas* per *Ann.* *Ans.* 23*l.* 5*s.* 11 $\frac{1}{4}$ *d.*

21. Suppose a Gentleman's yearly Salary was 150*l.* *per Ann.* how much may he spend *per Day* to lay up 20 Guineas at the Year's End? *Ans.* 7*s.* 0 $\frac{1}{4}$ *d.* $\frac{2}{3}$.

22. A Farmer sold 46 Quarters 3 Bushels of Wheat at 4*s.* 9*d.* *per Bushel*, I demand the Price of the Whole? *Ans.* 88*l.* 2*s.* 3*d.*

23. If a Box of Candles weighs 2 C. 1 Qr. 19*lb.* what do they come to at 7*s.* 8*d.* *per Dozen*? *Ans.* 8*l.* 13*s.* 1 $\frac{1}{2}$ *d.* $\frac{8}{12}$.

24. If 1 $\frac{1}{2}$ Gallon of Wine cost 8*s.* 10 $\frac{1}{2}$ *d.* what cost 35 Hogheads, 27 Gall. and 5 Pints? *Ans.* 660*l.* 9*s.* 8 $\frac{1}{4}$ *d.* $\frac{6}{12}$.

25. I gave 11*l.* 9*s.* 6*d.* for 4 Boxes of Candles; what do they weigh at 6 $\frac{1}{2}$ *d.* *per lb.* *Ans.* 423*lb.* $\frac{9}{13}$.

26. Bought, 21 Pieces of Lace, each containing 27 Yards, at 3*s.* 9 $\frac{1}{2}$ *d.* *per Ell Flemish*; how much is the Value of the Whole? *Ans.* 143*l.* 6*s.* 6*d.*

27. A Mercer sold 40 Pieces of Silk for 726*l.* 12*s.* 6*d.* by which he gained as much as one Piece cost him. I demand the Price of that Piece? *Ans.* 18*l.* 3*s.* 3 $\frac{1}{4}$ *d.*

28. Bought, 12 Chests of Sugar for 38*l.* 17*s.* 6*d.* what do they weigh, at 6 $\frac{1}{2}$ *d.* *per lb.*? *Ans.* 12 C. 3 qrs. 7*lb.*

29. What cost a Hoghead of Wine at 9*d.* *per Pint*? *Ans.* 18*l.* 18*s.*

30. If a Servant's Wages is 7*l.* a Year; what is that *per Day*? *Ans.* 4 $\frac{1}{2}$ *d.* $\frac{1}{3}$ $\frac{50}{63}$.

31. A Farmer purchased a Piece of Ground for 580*l.* I demand how many Acres were contained in the same, supposing he gave at the Rate of 2*s.* 3*d.* *per Acre*? *Ans.* 5155 $\frac{1}{7}$ Acres.

32. Suppose a Room is 19 Feet broad and 24 Feet long, how many Yards of Matting of 1 $\frac{1}{4}$ Foot wide will it take to cover the same? *Ans.* 86 Yards, 2 $\frac{1}{2}$ Feet.

33. A Draper paid 297*l.* 16*s.* for a Parcel of Cloth, and found that it stood him in 2*s.* 6*d.* *per Ell Flemish*; what Quantity of Cloth did he buy in? *Ans.* 2382 $\frac{2}{3}$ Ells.

34. A Gentleman having a Parcel of old Houses to dispose of for 212*l.* *per Ann.* for 11 Years and 3 Quarters Purchase; what do they amount to? *Ans.* 2491*l.*

35. If one Skin cost 8 $\frac{1}{2}$ *d.* what is the Value of 18 Score 7 Dozen and 9 Skins? *Ans.* 16*l.* 0*s.* 10 $\frac{1}{2}$ *d.*

36. A Gentleman is able to spend 1*l.* 15*s.* 4*d.* *per Day*, and lays up at the Year's End 800*l.* to purchase with; what was his yearly Income? *Ans.* 1444*l.* 16*s.* 8*d.*

37. If the Expences of the People in the City of London

42 *Single Rule of Three.*

ACCOMPTANT'S

and *Westminster* be 59520*l.* per Day, how much will keep them a Year and a Quarter? *Ans.* 27156000.

38. A Goldsmith bought a Wedge of Gold which weighed 13*lb.* 4*oz.* 8*dwt.* 9*gr.* for 472*l.* 10*s.* what did he pay per Ounce? *Ans.* 2*l.* 18*s.* 10 $\frac{3}{4}$ *d.*

39. Suppose a Tax of 11*l.* 6*s.* 1 $\frac{1}{2}$ *d.* be assessed on an Estate worth 250*l.* per Ann.; I demand at what the Rate is per Pound? *Ans.* 7 $\frac{3}{4}$ *d.* $\frac{4}{356}$.

40. A Tradesman hath owing him 150*l.* and his Debtor doth agree to pay him 12*s.* 6*d.* for every Pound; the Question is, what must he pay him for the Whole, and what he must lose by this Abatement? *Ans.* he must pay him 93*l.* 15*s.* and the Loss will be 56*l.* 5*s.*

41. Suppose I gave 9*l.* 11*s.* 6*d.* for a Silver Tankard; what does it weigh at 5*s.* 3*d.* per *oz.* *Ans.* 36*oz.* 9*dwt.* 12*gr.* $\frac{36}{3}$.

42. A Sailor having been on board of a man of War from the 15th of *October* 1757, to the 25th of *June* 1761 inclusive, what comes his Wages to, at 1*l.* 10*s.* 6*d.* per Month, reckoning 28 Days? *Ans.* 73*l.* 10*s.* 6 $\frac{1}{4}$ *d.*

43. My Partner at *Jamaica* informs me, there is made of the Sale of 150 Dozen Pair of Shoes 97 C. 3 Qrs. 10*lb.* of Sugar; how much of the said Sugar may my Partner lay Claim to for 93. Dozen Pair that was his? *Answer* 60 C. 2*qrs.* 18*lb.*

44. Bought, 27 Pieces of Holland, each containing 24 $\frac{3}{4}$ Yards for 145*l.* 17*s.* 9*d.* what is the value of one *Flemish* Ell? *Ans.* 3*s.* 3 $\frac{1}{4}$ *d.* $\frac{597}{200}$.

45. Suppose I reckon my Expences to be 3*l.* 5*s.* per Week, out of an Income of 230*l.* 14*s.* 9*d.* per Ann. how much can I lay up at the Year's End? *Ans.* 61*l.* 14*s.* 9*d.*

46. A Plumber bought 14 Fodder of Lead at 1 $\frac{1}{4}$ *d.* per *lb.* what did the whole Quantity cost him? *Ans.* 222*l.* 19*s.*

47. If a Builder pays to Workmen 17 Guineas every 4 Weeks, how many Days will 100 Guineas pay them? *Ans.* 141 Days $\frac{3}{7}$.

48. A Merchant bought 12 Pieces of Lace, each containing 23 Ells, 1 Qr. 2 Ns. *Flemish*, and gave after the Rate of 1*l.* 6*s.* 8*d.* for 5 *English* Ells; I desire to know what the 12 Pieces stood him in? *Ans.* 45*l.* 2*s.* 4 $\frac{3}{4}$ *d.* $\frac{22}{100}$.

49. Suppose I gave 4*s.* 6*d.* per Ell *English* for 20 Pieces of *Irish* Cloth, which cost me in all 109 Guineas; how many Ells were there in each Piece? *Ans.* 26 Ells 8 over $\frac{2}{3}$. A

50. A Merchant imported 12 Tuns of Wine at 9 Guineas *per* Tun, and paid for Freight 29*l.* 10*s.* for Custom 32*l.* 5*s.* Loading, Unloading and Cartage 5*l.* 4*s.* 6*d.* What did this Wine stand him in *per* Gallon? *Answ.* 1*s.* 2¼*d.* ⅙.

THE RULE of THREE INVERSE.

Is that by which from three Numbers given, we find a fourth in a reciprocal Proportion, inverted to the Proportion given.

The Analogy is, as the first Term is to the third, so is the second to the fourth. And as the second is to the third, so is the first to the fourth.

Rule. When you have stated your question, multiply the first and second Terms together for a Dividend, and divide by the third, and the Quotient is the Answer.

EXAMPLES,

1. If 32 Men build a House in 48 Days, in how many Days will 64 Men do the same?

Men	Days.	Men
If 32	48	64
48	64	1536
256	128	24
128	.256	
1536	256	

Answ. 24 Days.

Now the more men being employed, they consequently require the less Time. And this is when more requires less.

2. If 64 Men build a House in 24 Days, in how many Days will 32 Men do the same? *Answ.* 48 Days.

Now as the less Number of Men being employed they will require the more Time. And this is when less requires more, and is a Proof of the former Question.

3. If (according to the Standard Statute or Law of *England*) the Penny Loaf must weigh, when Wheat is at 5 Shillings the Bushel 70*z.* 7*dwt.* Troy, or 8*oz.* Avoirdupois, how much must it weigh when Wheat is 2*s.* 6*d.* *per* Bushel? *Answ.* 1*lb.* 20*z.* 14*dwt.* Troy, or 1*lb.* Avoirdupois.

4. Suppose a Threepenny Loaf weighs 2*lb.* 30*z.* when a Bushel of Wheat costs 4*s.* 9*d.* what is a Bushel of the same

same worth when the Threepenny Loaf weighs 1lb. 9oz.
Answ. 6s. 1d $\frac{3}{4}$.

5. How many Yards of Shalloon that is Ell wide will line 140 Yards of Cloth 3 Quarters wide? *Answ.* 84 yds.

6. A Person has a Room 24 Feet long and 18 broad, the Top of which he would hang with Paper of 18 Inches broad; how many Yards of Paper must he have to compleat his Room? *Answ.* 96 Yards.

7. Suppose one lends 1200 Pounds 12 Months, how much must be lent 72 Months to requite the former Favour? *Answ.* 200 Pounds.

8. Suppose a Building was raised in 16 Months by 240 Men, and another of the same Model is required in 4 Months, how many Men must be employed to compleat the same? *Answ.* 960 Men.

9. Suppose a Garrison of 2400 Soldiers, and their Provisions were computed to last them 4 months, how many must be sent away that the Provisions may be sufficient for the remaining 16 Months? *Answ.* 1800.

10. If a field will graze 24 Horses 9 Weeks, how many Horses will it graze 56 Weeks? *Answ.* 6 Horses.

11. The Carriage of 2400 Pounds Weight 72 Miles cost 2l. 8s. how many Pounds Weight shall I have carried 216 Miles for the same Money? *Answ.* 800 Pounds Weight.

12. A Cistern has three Cocks, which will empty it in 48 Hours, how many Cocks of the same Bore will empty it in 6 Hours? *Answ.* 24 Cocks.

13. If when Beer is 74 Shillings *per* But, 24 Shillings worth will serve 288 Men, how many Men will the same 24 Shillings worth serve when Beer is 5l. 8s. *per* But? *Answ.* 197 Men.

14. If 24 Men finish a Piece of Work in 24 Hours, how many Men would finish the same in 3 Hours? *Answ.* 192 Men.

15. If a Person performs a Journey of 908 Miles in 32 Days, when the Days are 16 Hours long, how many Days will it require of him when they are but 12 Hours long? *Answ.* 42 Days and 16 Hours.

P R A C T I C E,

IS so called from the great Use and Practice of it in common Affairs, and may be resolved by Operations
more

more speedy and practical than those of the Rule of Three when the first Term is one. Which may be proved by Compound Multiplication, the Single Rule of Three Direct, or by varying the Parts.

Note. The following are Tables of Aliquot (or even Parts) of Money.

s.	d.	
10	0	$\frac{1}{2}$ of a Pound
6	8	$\frac{1}{3}$
5	0	$\frac{1}{4}$
4	0	$\frac{1}{5}$
3	4	$\frac{1}{6}$
2	6	$\frac{1}{8}$
2	0	$\frac{1}{10}$
1	8	$\frac{1}{12}$
1	4	$\frac{1}{15}$
1	3	$\frac{1}{16}$
1	0	$\frac{1}{20}$
0	10	$\frac{1}{24}$
0	8	$\frac{1}{30}$
0	$7\frac{1}{2}$	$\frac{1}{32}$
0	6	$\frac{1}{40}$
0	5	$\frac{1}{48}$
0	4	$\frac{1}{60}$
0	$3\frac{3}{4}$	$\frac{1}{64}$

s.	d.	
0	3	$\frac{1}{80}$
0	$2\frac{1}{2}$	$\frac{1}{96}$
0	2	$\frac{1}{120}$
0	$1\frac{1}{2}$	$\frac{1}{160}$
0	$1\frac{1}{4}$	$\frac{1}{192}$
0	1	$\frac{1}{240}$
0	$0\frac{1}{2}$	$\frac{1}{480}$
0	$0\frac{1}{4}$	$\frac{1}{960}$

The even Parts of a Shilling.
6 Pence is Half

4	is	$\frac{1}{3}$
3	is	$\frac{1}{4}$
2	is	$\frac{1}{6}$
$1\frac{1}{2}$	is	$\frac{1}{8}$
1	is	$\frac{1}{12}$

SECTION I.

When the given Price is an Aliquot Part of a Pound, Shilling or Penny, divide the given Quantity by the Aliquot Part, and the Product will be the Answer.

4672 at 10s. per Yd. 3100 at 3s. 4d. 1802 at 1s. 4d.
fa. 2336l. fa. 516l. 13s. 4d. fa. 120l. 2s. 8d.

1750 at 6s. 8d. 7180 at 2s. 6d. 1900 at 1s. 3d.
fa. 583l. 6s. 8d. fa. 897l. 10s. fa. 118l. 15s.

1894 at 5s. 7420 at 2s. 1874 at 1s.
fa. 473l. 10s. fa. 742l. fa. 93l. 14s.

3196 at 4s. 7560 at 1s. 8d. 1780 at 0s. 10d.
fa. 639l. 4s. fa. 630l. fa. 74l. 3s. 4d.

46 *Practice.*

1970 at os. 8d.
fa. 65l. 13s. 4d.

7200 at os. 7d. $\frac{1}{2}$
fa. 225l.

4808 at os. 6d.
fa. 120l. 4s.

7290 at os. 5d.
fa. 151l. 17s. 6d.

7890 at os. 4d.
fa. 131l. 10s.

1270 at os. $3\frac{1}{4}$ d.
fa. 19l. 16s. $10\frac{1}{2}$ d.

1760 at os. 3d.
fa. 22l.

1974 at os. $2\frac{1}{2}$ d.
fa. 20l. 11s. 3d.

1790 at os. 2d.
fa. 14l. 18s. 4d.

1750 at os. $1\frac{1}{2}$ d.
fa. 10l. 18s. 9d.

ACCOMPTANT'S

1654 at os. 1d.
fa. 6l. 17s. 10d.

1750 at os. $0\frac{1}{4}$ d.
fa. 5l. 9s. $4\frac{1}{2}$ d.

1970 at os. $0\frac{1}{2}$ d.
fa. 4l. 2s. 1d.

1874 at os. $0\frac{1}{4}$ d.
fa. 1l. 19s. $0\frac{1}{2}$ d.

SECTION II.

When the given Price is not an aliquot Part of a Pound, Shilling, or Penny, divide it into several aliquot Parts, then work as before; but it commonly can be so divided that the less are aliquot Parts of the greater, then take those Parts and add their Quotients together, and that Product divided by 20 will give the Answer.

per Yd.

8790 at os. $1\frac{3}{4}$ d.
fa. 64l. 1s. $10\frac{1}{2}$ d.

7080 at os. $2\frac{1}{4}$ d.
fa. 66l. 7s. 6d.

7980 at os. $2\frac{3}{4}$ d.
fa. 91l. 8s. 9d.

9080 at os. $3\frac{1}{4}$ d.
fa. 122l. 19s. 2d.

4804 at os. $3\frac{1}{2}$ d.
fa. 70l. 1s. 2d.

4890 at os. $4\frac{1}{4}$ d.
fa. 86l. 11s. $10\frac{1}{2}$ d.

4876 at os. $4\frac{1}{2}$ d.
fa. 91l. 8s. 6d.

4970 at os. $4\frac{3}{4}$ d.
fa. 98l. 7s. $3\frac{1}{2}$ d.

5970 at os. $5\frac{1}{4}$ d.
fa. 130l. 11s. $10\frac{1}{2}$ d.

4952 at os. $5\frac{1}{2}$ d.
fa. 113l. 9s. 8d.

5420 at os. $5\frac{3}{4}$ d.
fa. 129l. 17s. 1d.

5431 at os. $6\frac{1}{4}$ d.
fa. 141l. 8s. $7\frac{3}{4}$ d.

4720 at os. $6\frac{1}{2}$ d.
fa. 127l. 16s. 8d.

4270 at os. $6\frac{3}{4}$ d.
fa. 120l. 1s. $10\frac{1}{2}$ d.

5902 at os. 7d.
fa. 172l. 2s. 10d.

1972 at os. $7\frac{1}{4}$ d.
fa. 59l. 11s. 5d.

2100 at os. $7\frac{3}{4}$ d.
fa. 67l. 16s. 3d.

1974 at os. $08\frac{1}{4}$ d.
fa. 67l. 17s. $1\frac{1}{2}$ d.

1780 at os. $8\frac{1}{2}$ d.
fa. 63l. os. 10d.

2500 at os. $8\frac{3}{4}$ d.
fa. 91l. 2s. 11d.

2708 at os. 9d.
fa. 101l. 11s.

COMPANION.

Practice. 47

2570 at os. $9\frac{1}{4}d.$ <i>fa.</i> 99l. 1s. $0\frac{1}{4}d.$	8642 at 1s. $1\frac{1}{4}d.$ <i>fa.</i> 477l. 2s. $2\frac{1}{2}d.$	1768 at 1s. $5\frac{1}{4}d.$ <i>fa.</i> 127l. 1s. 6d.
1984 at os. $9\frac{1}{2}d.$ <i>fa.</i> 78l. 10s. 8d.	7346 at 1s. $1\frac{3}{4}d.$ <i>fa.</i> 420l. 17s. $3\frac{1}{2}d.$	1970 at 1s. $5\frac{1}{2}d.$ <i>fa.</i> 143l. 12s. 11d.
2760 at os. $9\frac{3}{4}d.$ <i>fa.</i> 112l. 2s. 6d.	7400 at 1s. $2\frac{1}{4}d.$ <i>fa.</i> 439l. 7s. 6d.	1942 at 1s. $6\frac{3}{4}d.$ <i>fa.</i> 151l. 14s. $4\frac{1}{2}d.$
2500 at os. $10\frac{1}{4}d.$ <i>fa.</i> 106l. 15s. 5d.	2760 at 1s. $2\frac{3}{4}d.$ <i>fa.</i> 169l. 12s. 6d.	1790 at 1s. $7\frac{1}{4}d.$ <i>fa.</i> 143l. 11s. $5\frac{1}{2}d.$
1780 at os. $10\frac{1}{2}d.$ <i>fa.</i> 77l. 17s. 6d.	2500 at 1s. $3\frac{1}{4}d.$ <i>fa.</i> 158l. 47s. 1d.	1890 at 1s. $7\frac{3}{4}d.$ <i>fa.</i> 155l. 10s. $7\frac{1}{2}d.$
1798 at os. $10\frac{3}{4}d.$ <i>fa.</i> 80l. 10s. $8\frac{1}{2}d.$	2752 at 1s. $3\frac{3}{4}d.$ <i>fa.</i> 180l. 12s.	1742 at 1s. $8\frac{3}{4}d.$ <i>fa.</i> 150l. 12s. $2\frac{1}{2}d.$
2008 at os. 11d. <i>fa.</i> 92l. os 8d.	2706 at 1s. 4d. <i>fa.</i> 180l. 8s.	1595 at 1s. $9\frac{1}{4}d.$ <i>fa.</i> 144l. 10s. $11\frac{1}{4}d.$
2406 at os. $11\frac{1}{4}d.$ <i>fa.</i> 112l. 15s. $7\frac{1}{2}d.$	2752 at 1s. $4\frac{1}{4}d.$ <i>fa.</i> 186l. 6s. 8d.	1890 at 1s. $10\frac{1}{2}d.$ <i>fa.</i> 177l. 3s. 9d.
2370 at os. $11\frac{1}{2}d.$ <i>fa.</i> 113l. 11s. 3d.	1980 at 1s. $4\frac{1}{2}d.$ <i>fa.</i> 136l. 2s. 6d.	1900 at 1s. $10\frac{3}{4}d.$ <i>fa.</i> 180l. 2s. 1d.
2970 at os. $11\frac{3}{4}d.$ <i>fa.</i> 145l. 8s. $1\frac{1}{2}d.$	1760 at 1s. $4\frac{3}{4}d.$ <i>fa.</i> 122l. 16s. 8d.	1742 at 1s. $11\frac{1}{2}d.$ <i>fa.</i> 170l. 11s. 5d.
7080 at 1s. $0\frac{1}{4}d.$ <i>fa.</i> 361l. 7s. 6d.	1970 at 1s. 5d. <i>fa.</i> 139l. 10s. 10d.	1870 at 1s. $11\frac{3}{4}d.$ <i>fa.</i> 185l. 1s. $0\frac{1}{2}d.$

SECTION III.

When the given Price is any even Number of Shillings, Multiply the given Quantity by half the given Price and double the Units Place for Shillings; and the rest will be Pounds and the Answer to the Question.

EXAMPLES.

643 at 4s.
2

2460 at 6s.
fa. 738l.

976 at 18s.
fa. 878l. 8s.

128 12s.

7843 at 14s.
fa. 5490l. 2s.

728 at 11. 8s.
fa. 1019l. 4s.

48 *Practice.*

ACCOMPTANT'S

248 at 1l. 18s.
fa. 47l. 4s.

789 at 2l. 6s.
fa. 1814l. 14s.

840 at 5l. 18s.
fa. 4956l.

27 at 18l. 10s.

fa. 499l. 10s.

SECTION IV.

If there be Shillings, Pence, and Farthings, or only Shillings and Pence, which are not Aliquot Parts of a Pound, multiply the given Quantity by the Shillings, and take Parts for the rest, and add them together; the Product will be the Answer in Shillings.

EXAMPLES.

206 at 3s. 2d.

$\frac{1}{2}$

3

618

34 4

20) 65(2 4
facit 32l. 12s. 4d.

708 at 13s 9 $\frac{1}{2}$ d
fa. 488l 4s 6d

27 at 3l 18s 4d
fa. 105l 15s.

260 at 5s. 10 $\frac{1}{2}$ d.
fa. 76l. 7s. 6d.

720 at 14s 11 $\frac{1}{2}$ d
fa. 538l 10s

48 at 4l 1 $\frac{3}{4}$ d
fa. 192l 7s

240 at 9s. 2d.
fa. 110l.

28 at 15s 4d
fa. 21l 9 s. 4d

90 at 4l 17s 8d
fa. 439l 10s

240 at 11s. 4 $\frac{1}{2}$ d.
fa. 136l. 10s.

928 at 18s 3 $\frac{1}{4}$ d
fa. 849l 14s

44 at 11l 14s 6d
fa. 515l 18s

1201 at 12s. 7 $\frac{1}{2}$ d.
fa. 758l. 2s. 7 $\frac{1}{2}$ d

571 at 19s 3 $\frac{1}{4}$ d
fa. 544l 4s 8 $\frac{1}{4}$ d

50 at 12l 1 $\frac{1}{2}$ d
fa. 600l 6s 3d

708 at 13s. 9d.
fa. 486l 15s

29 at 2l 13s 10d
fa. 78l 1s 2d

SECTION V.

If there is a Fraction in the given Quantity, find the Value of the Fraction by multiplying the given Price by the Numerator, and dividing the Product by the Denomination, when added to the Product of the given Quantity will be the Answer.

Yds.

EXAMPLES.

7ds. *l.* *s.* *d.*
 72 $1\frac{1}{2}$ at 0 2 6

345 $\frac{3}{4}$ at 1 11 10

435 $\frac{3}{5}$ at 0 5 $6\frac{1}{2}$

405 $\frac{3}{7}$ at 0 7 $9\frac{1}{2}$

391 $\frac{3}{8}$ at 0 3 $2\frac{1}{4}$

279 $\frac{5}{8}$ at 0 9 $7\frac{1}{2}$

572 $\frac{5}{9}$ at 0 7 $9\frac{3}{4}$

721 $\frac{3}{10}$ at 0 12 $3\frac{1}{2}$

fa. *l.* *s.* *d.*
 90 3 9

fa. 550 6 $4\frac{1}{2}$

fa. 120 13 $11\frac{1}{4}$

fa. 157 18 $11\frac{1}{2}$

fa. 62 7 6

fa. 134 11 $4\frac{1}{2}$

fa. 223 13 1

fa. 443 5 $11\frac{3}{4}$

SECTION. VI.

When the Price of an Integer and the given Quantity are of several Denominations, multiply the Price by the Integers, and take Parts with the Parts of the Integer; in order to which it will be necessary to remember the following Table, of the equal Parts of a Hundred Weight.

56 is the Half

28 is the 4th

16 is the 7th

14 is the 8th

7 is the 16th

4 is the 28th

2 is the 56th

C 2 *lb*

9 2 14 of Sugar at 1 17 4

9

2 16 16 0

8 18 8

4 8

17 19 4 *facit.*

31C 22 16lb of Tobacco at 3l 14s 7d per Cwt.

Facit 43l 8s $4\frac{1}{4}$ d

F

15C

- 15C 3℥ 12lb of Sugar at 2l 1s 2d per Cwt.
Facit 32l 12s 9½d
 7C 1℥ 13lb of Tallow at 3l 17s 4¼ per Cwt.
Facit 28l 9s 9½d
 9C 0℥ 19lb of Soap at 4l 17s 2d per Cwt.
Facit 44l 10s 11½d
 7C 1℥ 0lb of Sugar at 3l 7s 5½ per Cwt.
Facit 24l 9s 0¾d
 5C 1℥ 15lb of Tobacco at 3l 14s 7¼ per Cwt.
Facit 20l 1s 7¾d
 9C 2℥ 17lb of Tallow at 2l 15s 9d per Cwt.
Facit 26l 18s. 0d.
 4C 3℥ 21lb of Sugar 3l 5s 7½ per Cwt.
Facit 16l 4s 4d
 17C 3℥ 27lb of Cloves at 7l 7s. 5½d per Cwt.
Facit 132l 12s 11d
 7lb 12Oz 14Drs at 1l 7s 4d per Pound
Facit 10l 13s 3¾d
 14lb 11Oz 13Drs at 1l. 5s. 7½d per Pound
Facit 18l 17s 9d
 9 Oz 11Dwt. 21Gr at 5s 6d. per Ounce
Facit 2l 12s 9d
 7Oz 17Dwt. 20Gr at 6s 9d per Ounce
Facit 2l 13s 3d
 11Oz 5Dwt. 17Gr at 7s 3d per Ounce
Facit 4l 1s 9¾d
 6Oz 3Dwt. 19Gr at 5s 5d per Ounce
Facit 1l. 13s 6d
 7Gal. 3Pts at 5s 7d per Gallon
Facit 2l 1s 2d
 2Yds 3℥rs 2Nls at 14s 9d per Yard
Facit 2l 2s 4¾d
 1℥r 2Nls at 7s. 8d per Yard
Facit 2s. 10½d
 17Acr 1Rd : 1Prs at 1l 11s 2d per Acre
Facit 26l 19s 9d

SECTION VII.

When the given Quantity is but a Part of the Integer, or whole Thing, then you must take the Aliquot or even Parts as before.

EXAMPLES.

What's the Value of 3 Pounds at 4^l 7^s 6^d per Cwt ?

	£.	s.	d.
$\frac{1}{8}$	4	7	6
7		10	11 $\frac{1}{4}$
2		1	6 $\frac{3}{4}$
			9 $\frac{1}{4}$
	2	4	Answer

What's the Value of 5 Pounds at 7^l 14^s 9^d per Cwt ?

Ans^w. 0^l. 6^s 10 $\frac{3}{4}$ d

What's the Value of 7 Pounds at 5^l 7^s 9 $\frac{1}{2}$ d per Cwt ?

Ans^w. 0^l 6^s 8 $\frac{3}{4}$ d

What's the Value of 9 Pounds at 7^l 16^s 7^d per Cwt.

Ans^w. 0^l 12^s 7^d

What's the Value of 11 Pounds at 4^l. 16^s 8 $\frac{1}{4}$ d per Cwt ?

Ans^w. 0^l 9^s 5 $\frac{3}{4}$ d

What's the Value of 12 Pounds at 9^l 14^s 2^d per Cwt ?

Ans^w. 1^l 0^s 9 $\frac{1}{2}$ d

What's the Value of 13 Pounds at 2^l 19^s 11 $\frac{3}{4}$ d per Cwt?

Ans^w. 6^s 11^d

What's the Value of 49 Pounds at 5^l 17^s per Cwt ?

Ans^w. 2^l 11^s 4^d.

What's the Value of 79 Pounds at 7^l 4^s 6^d per Cwt ?

Ans^w. 5^l. 1^s. 11^d

T A R E A N D T R E T T.

IN this Rule there are six Things to be observed, *viz.* the Gross Weight, the Tare, the Suttle, the Trett, the Cloff, and the Neat.

Gross Weight is the Weight of the Goods, including the Cask, Vessel, Bag, Box, or whatever they are packed up in.

Tare is an Allowance made to the Purchaser, for the Weight of the Cask, Bag, or Box, and whatever else contains the Goods bought; and is at so much *per* Bag, &c. or so much *per* Hundred Weight, or so much in the whole Gross.

Suttle is when the Tare is taken from the Gross, and another Abatement is to be made.

whole Gros by it, and subtract the Quotient from the Gros; the Remainder will be the neat Weight. But if the Tare is not an aliquot Part or Parts of an Hundred Weight, then the Pounds Gros must be multiplied by the given Tare, and divided by 112, and that Quotient will be the whole Tare; which, subtracted from the Gros, will give the neat Weight.

EXAMPLES.

1. In 9 Barrels of Soap, each 4 Cwt. 2 qrs. 7 lb. Gros. Tare 16 lb. in 112 lb. how many Pounds neat?

C. Q. lb.

4 2 7
9

$\frac{1}{7}41$ 0 7
5 3 13

Ans. 35 0 22

2. In 11 Hhds. of Raisins, each Hhd. weighing 9 Cwt. 3 qrs. 19 lb. Gros, Tare 10 lb. per 112 lb. how many Cwt? Ans. 99 Cwt. 1 qr. 14 lb.

3. In 12 Hhds. of Sugar, each Hhd. weighing 12 Cwt. 3 qrs. 21 lb. Gros, Tare 14 lb. in 112 lb. how many Pounds neat? Ans. 15214 $\frac{1}{2}$

4. In 50 Barrels of Starch, each weighing 2 Cwt. 0 qrs. 19 lb. Gros, Tare 12 lb. per 112 lb. how many Pounds neat? Ans. 10849 lb. neat

5. In 2 Hhds. of Sugar, each weighing 6 $\frac{1}{2}$ Cwt. Tare 10 lb. in 112 lb. how much neat Weight? Ans. 11 Cwt. 3 qrs. 10 lb.

Bought 4 Hhds. of Sugar, Weight gros as under:

	C.	Q.	lb.		lb.
N ^o 1	4	2	12	} Tare {	97
2	3	3	17		84
3	5	1	9		109
4	4	1	19		92

Ans. 14 Cwt. 3 qrs. 11 lb.

SECTION III.

When the Tare and Trett are both allowed, the Rule is, to subtract the Tare from the Gros, the Remainder is the Suttle; which divide by 26, being the 4th Part of 104; the Quotient will be the Trett, which deduct from the Suttle; the Remainder is the Neat.

1. In ten Barrels of Spices, each Gross 2 Cwt. 3 qrs 11 lb. Tare 22 lb. per Barrel, Trett 4 lb. in 104 lb. I demand the neat Weight? *Ans.* 25 Cwt. 2 qrs. 0 lb.

2. In 27 Cwt. 3 qrs. 12 lb. of Spices, Gross, Tare 12 lb. per 112 lb. Trett 4 lb. per 104 lb. I demand the neat Weight? *Ans.* 23 Cwt. 3 qrs. 19 lb.

3. What is the neat Weight of 17 Bags of Coffee, each weighing Gross 3 Cwt. 2 qrs. 19 lb. Tare 15 lb. per 112 lb. Trett 4 lb. per 104 lb? *Ans.* 51 Cwt. 3 qrs. 24 lb.

4. In 11 Barrels of Starch, weighing each Gross 3 Cwt. 1 qr. 27 lb. Tare 8 lb. per 112 lb. Trett 4 lb. per 104 lb. I demand the neat Weight? *Ans.* 34 Cwt. 1 qr. 5 lb.

5. In 135 Sacks of Ginger, each weighing Gross 2 Cwt. 3 qrs. 21 lb. Tare 9 lb. per 112 lb. Trett 4 lb. per 104 lb. How many Cwt. neat? *Ans.* 350 C. 2 qrs. 19 lb.

6. Suppose 1 qr. 3 lb. per Cwt. Tare 4 lb. per 104 lb. Trett were allowed on 9 Casks of Raisins, each 2 C. 3 qrs. 25 lb. Gross, what would be the neat Weight, and the Value, at $3\frac{1}{4}d.$ per Pound? *Ans.* 31 10s. 11 $\frac{1}{4}d.$ Wt. 18 C. 2 qrs. 11 lb.

SECTION IV.

If Cloff is allowed, then the Pounds Suttle must be multiplied by the given Allowance and divided by 3 Cwt. and the Product subtract from the Suttle, and the Remainder will be neat.

EXAMPLES.

1. In 3 Hhds of Sugar, weighing gross 21 C. 1 qr. 15 lb. Tare 1 qr. 7 lb. per Cwt. Trett 4 lb. per 104 lb. Cloff 2 lb. per 3 Cwt. How much neat, and what the Value, at $7\frac{1}{2}d.$ per lb? *Ans.* Wt. 14 C. 0 2. 7 lb. Value 49l. 4s. 4 $\frac{1}{2}d.$

2. In 3 Butts of Currants, each 5 C. 1 qr. 19 lb. Gross, Tare 3 qrs. 14 lb. per Butt, Trett 4 lb. per 104 lb. Cloff 3 lb. per Cwt. how much neat Weight, and what is the Value at 1l. 7s. 9d. per Cwt? *Ans.* 18l. 0s. 9d. Wt. 13 C. 0 qrs. 0 lb.

3. Bought, 4 Casks of Oil, Number and Weight as follow; N^o. 1. 2 C. 0 qr. 17 lb. N^o. 2. 1 C. 3 qrs. 19 lb. N^o. 3. 2 C. 1 qr. 5 lb. N^o. 4. 1 C. 3 qrs. 9 lb. Gross, Tare 17 lb. per 112 lb. I demand how many Gallons, and what is the Value at 5s. 2d. per Gallon? *Ans.* 26l. 16s. 7 $\frac{1}{2}d.$ Gal. 103, 3 qts. 1 pt.

4. In 5 Casks of Oil, each weighing 2 C. 3 qrs. 27 lb. Gross, how many neat Gallons, allowing 12 lb. per Cwt. Tare, and what is the Value at $9\frac{1}{4}d.$ per Pint? *Ans.* 64l. 16s. 9d. Gal. 199 1qrt. 2 pts.

VULGAR FRACTIONS.

NOTATION of Fractions depends upon this Supposition, that one whole Thing, whatsoever it be, may be conceived divisible into any Number of equal Parts. A Fraction, or broken Numbers, is one or more Part, or Parts of an Integer, or whole Thing, according as it is divided; and must consist of two Parts, *viz.* A Numerator, and Denominator, which are placed one above the other, and separated by a Line thus, $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{5}{7}, \&c.$ and are thus expressed: One-half, Two-thirds, Three-fourths, Five-sevenths, &c. The Denominator is placed below the Line, and sheweth into how many equal Parts the Integer Unit is divided. The Numerator is set above the Line, and sheweth how many of the said equal Parts are in the Fraction. A Vulgar Fraction is either Simple or Compound; a simple Fraction is the Fraction of an Integer; as $\frac{3}{9}, \frac{5}{7}, \frac{7}{42}$.

A Compound Fraction is a Fraction of a Fraction, as $\frac{2}{3}$ of $\frac{3}{4}$, $\frac{1}{2}$ of $\frac{1}{4}$, &c.

A simple Fraction is either Proper or Improper.

A proper Fraction has its Numerator less than the Denominator.

An improper Fraction, hath the Numerator greater than its Denominator, when the Numerator and Denominator are equal, the Fraction is equal to an Unit, as $\frac{3}{3}, \frac{6}{6}, \frac{8}{8}, \frac{12}{12}$, are all equal to 1, each being equal to one.

Note. When an Integer and a Fraction is joined together, then it is called a mixt Number.

ABBREVIATION of FRACTIONS.

A GENERAL RULE.

OF the Numerator and Denominator, divide the Greater by the Less; if any thing remains, divide the Divisor thereby; and thus continue to divide always the last Divisor by the last Remainder till nothing remains, (rejecting

ing the Quotients) and this last Divisor will be the greatest common Measure whereby the Numerator and Denominator must be divided, to bring the Fraction into its lowest Terms.

Note. If 1 be the last Divisor, the Fraction cannot be abbreviated, for it is in its lowest Terms already.

EXAMPLES.

1. Abbreviate $\frac{283}{1311}$, *Facit* $\frac{5}{23}$ by 57

2. $\frac{648}{576}$ $\frac{2}{3}$ by 72

Observe that one of the above Examples is a Proper, the other an Improper Fraction, which are reduced to their lowest Terms.

3. Abbreviate $\frac{364}{478}$ *Facit* $\frac{7}{52}$ by 52

4. $\frac{580}{725}$ to $\frac{4}{5}$ by 145

5. $\frac{3927}{4284}$ to $\frac{11}{12}$ by 357

6. $\frac{459}{672}$ to $\frac{17}{23}$ by 27

7. $\frac{442}{468}$ to $\frac{17}{18}$ by 26

8. $\frac{532}{693}$ to $\frac{7}{9}$ by 75

The preceding Rule is general, and may serve in all Cases, yet sometimes a Fraction may be abbreviated more speedily, by one of the following Rules.

1. When the Numerator and Denominator do each of them end with a Cypher, or Cyphers, cut off equal Cyphers in both, and the remaining Figures will be a Fraction of the same Value, in lesser if not in its least Terms.

EXAMPLES.

1. $\frac{11000}{13000}$ is equal to $\frac{11}{13}$ | 3. $\frac{320}{960}$ is equal to $\frac{32}{96}$ or $\frac{1}{3}$

2. $\frac{5300}{6800}$ is equal to $\frac{53}{68}$ | 4. $\frac{42000}{93000}$ is equal to $\frac{42}{93}$

2. If the Numerator and Denominator be even Numbers, the Fraction may always be abbreviated by 2, and sometimes by 4, 6, 8, &c.

1. $\frac{32}{128} = \frac{16}{64} = \frac{8}{32} = \frac{1}{4}$ | 3. $\frac{96}{144} = \frac{48}{72} = \frac{12}{18} = \frac{2}{3}$

2. $\frac{96}{324} = \frac{48}{162} = \frac{8}{27}$ | 4. $\frac{192}{320} = \frac{96}{160} = \frac{24}{40} = \frac{3}{5}$

3. When you discern any Number that will equally divide both Numerator and Denominator, you may abbreviate the Fraction thereby.

1. $\frac{28}{35} = \frac{4}{5}$ by 7 | 3. $\frac{168}{420} = \frac{2}{5}$ by 7, 6 and 2.

2. $\frac{54}{162} = \frac{1}{3}$ by 6 and 9 | 4. $\frac{168}{324} = \frac{3}{7}$ by 8 and 7.

REDUCTION of VULGAR FRACTIONS.

TO reduce Fractions of divers Denominations to a common Denominator. This Rule has two Parts to find the common Denominator, and to find the new Numerator.

Rule. Multiply all the Denominators together, for a common Denominator, and each Numerator into all the Denominators but its own, for a new Numerator.

Note. When a whole Number is to be expressed as a Fraction, it is only putting 1 for its Denominator, as 112 thus $\frac{112}{1}$

EXAMPLES.

1. Reduce $\frac{3}{4}$ and $\frac{5}{8}$ to a common Denominator, *Facit* $\frac{35}{40}$.
2. Reduce $\frac{7}{8}$, $\frac{9}{12}$ and $\frac{11}{14}$ to a common Denominator, *Facit* $\frac{1176}{1344}$, $\frac{1008}{1344}$, $\frac{1056}{1344}$.
3. Reduce $\frac{6}{8}$, $\frac{4}{12}$, $\frac{7}{6}$ and $\frac{11}{14}$ to a common Denominator, *Facit* $\frac{9072}{12096}$, $\frac{4032}{12096}$, $\frac{9408}{12096}$, $\frac{1504}{12096}$.
4. Reduce $\frac{1}{2}$, $\frac{2}{10}$, $\frac{5}{6}$ and $\frac{7}{8}$ to a common Denominator, *Facit*, $\frac{480}{960}$, $\frac{192}{960}$, $\frac{800}{960}$, $\frac{840}{960}$.
5. Reduce $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$ and $\frac{5}{6}$ into a common Denominator, *Facit*, $\frac{72}{144}$, $\frac{96}{144}$, $\frac{108}{144}$, $\frac{120}{144}$.
6. Reduce $\frac{4}{9}$, $\frac{7}{8}$, $\frac{9}{12}$ and $\frac{6}{14}$ to a common Denominator, *Facit* $\frac{5376}{6720}$, $\frac{5880}{6720}$, $\frac{5040}{6720}$, $\frac{2880}{6720}$.

SECTION I.

TO Reduce a COMPOUND FRACTION to a SIMPLE ONE equivalent thereto.

Rule. Multiply all the Numerators continually together, for a new Numerator, and all the Denominators for a new Denominator, and it is done; but it is best to express the Fraction in its lowest Terms.

EXAMPLES.

1. Reduce $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{4}$ to a simple Fraction, *Facit* $\frac{1}{4}$.
2. Reduce $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{4}{5}$ to a simple Fraction, *Facit* $\frac{2}{5}$.
3. Reduce $\frac{3}{4}$ of $\frac{4}{5}$ of $\frac{5}{6}$ to a simple Fraction, *Facit* $\frac{1}{4}$.
4. Reduce $\frac{1}{4}$ of $\frac{2}{3}$ of $\frac{3}{4}$ to a simple Fraction, *Facit* $\frac{1}{24}$.
5. Reduce $\frac{1}{3}$ of $\frac{1}{4}$ of $\frac{4}{5}$ to a simple Fraction, *Facit* $\frac{1}{30}$.
6. Reduce $\frac{5}{6}$ of $\frac{7}{8}$ of $\frac{1}{12}$ to a simple Fraction, *Facit* $\frac{35}{576}$.

S E C.

SECTION II.

To Reduce a MIXT NUMBER to an IMPROPER FRACTION.

Rule. Multiply the integral Part by the Denominator of the Fraction to the Product, add the Numerator, and under that Sum subscribe the Denominator with a small Stroke between them.

EXAMPLES.

1. Reduce $5 \frac{1}{2}$ to an improper Fraction, *Facit* $\frac{11}{2}$.
2. Reduce $7 \frac{5}{6}$ to an improper Fraction, *Facit* $\frac{47}{6}$.
3. Reduce $8 \frac{4}{5}$ to an improper Fraction, *Facit* $\frac{44}{5}$.
4. Reduce $14 \frac{1}{17}$ to an improper Fraction, *Facit* $\frac{249}{17}$.

SECTION III.

To Reduce an IMPROPER FRACTION to its PROPER TERMS.

Rule. Divide the Numerator by the Denominator, and the Quotient is the whole Number, and the Remainder place for a Numerator to the given Denominator.

EXAMPLES.

1. Reduce $\frac{11}{2}$ to a mixt Number, *Facit* $5 \frac{1}{2}$.
 2. Reduce $\frac{47}{6}$ to a mixt Number, *Facit* $7 \frac{5}{6}$.
 3. Reduce $\frac{44}{5}$ to a mixt Number, *Facit* $8 \frac{4}{5}$.
 4. Reduce $\frac{249}{17}$ to a mixt Number, *Facit* $14 \frac{1}{17}$.
- N. B.* These Examples prove the preceding ones.

SECTION IV.

To Reduce the FRACTION of one DENOMINATION, to the FRACTION of another.

Rule. If the given Fraction is less than the Fraction you want to reduce it to, compare it with all the Denominations betwixt it and that you would reduce it to, and make it a compound Fraction; and reduce that compound Fraction to a simple one. But if the given Fraction be greater than that you want to reduce it to, multiply the given Numerator by the Parts of the Denominations between it and that Denomination you would reduce it to, for a new Numerator, and place it over the given Denominator.

EXAMPLES.

1. Reduce $\frac{3}{4}$ of a Penny to the Fraction of a Pound. The compound Fraction will be $\frac{3}{4}$ of $\frac{1}{12}$ of $\frac{1}{20}$, and to reduce it to a simple Fraction is $\frac{3}{800}$, of equal Value with the given Fraction.

2. Re-

2. Reduce $\frac{1}{4}$ of a Farthing to the Fraction of a Shilling is $\frac{1}{96}$. The compound Fraction will be $\frac{1}{4}$ of $\frac{1}{4}$ of $\frac{1}{12}$ and reduced to a simple Fraction.

3. Reduce $\frac{4}{3}$ of an Ounce Troy, to the Fraction of a Pound, $\frac{4}{3}$ of $\frac{1}{12} = \frac{4}{36} = \frac{1}{9}$.

4. Reduce $\frac{3}{8}$ of a Pound Avoirdupois to the Fraction of Cwt. it will stand thus, $\frac{3}{8}$ of $\frac{1}{112} = \frac{3}{896}$.

5. Reduce $\frac{7}{9}$ of a Pint of Wine to the Fraction of a Hhd. it will stand thus, $\frac{7}{9}$ of $\frac{1}{2}$ of $\frac{1}{4}$ of $\frac{1}{63} = \frac{7}{4536}$.

SECTION V.

To find the Value of a Fraction in the known Parts of Coin, Weight, Measure, Motion, &c.

Rule. Multiply the Numerator of the Fraction, by the Parts of the next inferior Denomination that are equal to an Unit of the same Denomination with the Fraction, then divide that Product by the Denominator, and the Quotient will give its Value in the same Parts it was multiplied; and if any remains, multiply it by the Parts of the next inferior Denomination, and divide as before.

EXAMPLES.

1. What is the Value of $\frac{3}{4}$ of a Pound? *Answer* 15s.
2. What is the Value of $\frac{7}{8}$ of a Pound? *Answer* 17s. 6d.
3. What is the Value of $\frac{5}{8}$ of a Pound? *Answer* 12s. 6d.
4. What is the Value of $\frac{7}{16}$ of a Pound? *Answer* 8s. 9d.
5. What is the Value of $\frac{5}{16}$ of a Pound? *Answer* 6s. 3d.
6. What is the Value of $\frac{3}{4}$ of a Pound? *Answer* 5s.
7. What is the Value of $\frac{6}{8}$ of a Pound? *Answer* 14s. 9d.
- $\frac{1}{8}$ 8. What is the Value of $\frac{1}{24}$ of a Shilling? *Answer* 0s. 8 $\frac{1}{2}$ d.
9. What is the Value of $\frac{1}{8}$ of a Shilling? *Answer* 0s. 2 $\frac{1}{4}$ d. $\frac{1}{2}$.
- $\frac{2}{4}$ 10. What is the Value of $\frac{3}{4}$ of a Shilling? *Answer* 10d.
11. Reduce $\frac{1}{16}$ of a Pound Troy to its proper Quantity. *Facit* 8oz. 5dw.
12. Reduce $\frac{4}{12}$ of a Pound Avoirdupois to its proper Quantity. *Facit* 5oz. 5dr. $\frac{1}{3}$.
13. Reduce $\frac{6}{8}$ of a Tun Weight to its proper Quantity. *Facit* 6C. 2Q. 18lb. 10oz. 10dr. $\frac{4}{5}$.
14. Reduce $\frac{3}{7}$ of 9C. 3Q. 21lb. 15oz. 15dr. to its proper Quantity. *Facit* 4C. 1Q. 1lb. 6oz. 13dr $\frac{2}{7}$.
15. Reduce $\frac{1}{24}$ of a Chaldron of Coals to its proper Quantity. *Facit* 24 Bshs. 16.

16. Reduce $\frac{6}{9}$ of a Tun of Wine to its proper Quantity.
Facit 1 Pipe, 0 Hbd. 42 Gal.
17. Reduce $\frac{14}{17}$ of a natural Day to its proper Quantity.
Facit 19 H. 45 m. 52 se. $\frac{16}{17}$.
18. Reduce $\frac{7}{10}$ of a Yard to its proper Quantity. *Facit*
 2 qrs. 3 nls. $\frac{1}{3}$.
19. Reduce $\frac{6}{7}$ of a Barrel of Beer to its proper Quantity.
Facit 30 Gal. $\frac{6}{7}$.

SECTION VI.

To Reduce any GIVEN QUANTITY to a VULGAR FRACTION.

Rule, Bring the given Quantity to the lowest Terms mentioned for a Numerator, and put the Denomination of the same Term underneath, will be the Fraction required.

EXAMPLES.

1. Reduce 15 Shillings to the Fraction of a Pound.
Facit $\frac{3}{4}$.
2. Reduce 17s. 6d. to the Fraction of a Pound. *Facit* $\frac{7}{8}$.
3. Reduce 12s. 6d. to the Fraction of a Pound. *Facit* $\frac{5}{8}$.
4. Reduce 8s. 9d. to the Fraction of a Pound. *Facit* $\frac{7}{16}$.
5. Reduce 6s. 3d. to the Fraction of a Pound. *Facit* $\frac{5}{16}$.
6. Reduce 5s. 0d. to the Fraction of a Pound. *Facit* $\frac{1}{4}$.
7. Reduce 14s. 9d. $\frac{12}{84}$ to the Fraction of a Pound. *Facit*
 $\frac{31}{42}$.
8. Reduce 0s. 8 $\frac{1}{2}$ d. to the Fraction of a Shilling. *Facit*
 $\frac{17}{24}$.
9. Reduce 0s. 2 $\frac{1}{4}$ d. $\frac{1}{7}$ to the Fraction of a Shilling. *Facit*
 $\frac{4}{21}$.
10. Reduce 0s. 10d. $\frac{2}{43}$ to the Fraction of a Shilling.
Facit $\frac{36}{43}$.
11. Reduce 2l. 15s. 1 $\frac{1}{2}$ d. to the Fraction of 7l. 7s. *Facit* $\frac{3}{8}$.
12. Reduce 8oz. 5dw. to the Fraction of a Pound Troy.
Facit $\frac{11}{16}$.
13. Reduce 5oz. 5dr. $\frac{1}{3}$ to the Fraction of a Pound Avoirdupois. *Facit* $\frac{1}{3}$.
14. Reduce 6C. 2qrs. 18lb. 10oz. 10dr. $\frac{4}{6}$, to the Fraction of a Ton Weight. *Facit* $\frac{1}{3}$.
15. Reduce 3C. 1qr. 7lb. 5oz. 5drs. to the Fraction of 9C. 3qrs. 21lb. 15oz. 15drs. *Facit* $\frac{1}{3}$.
16. Reduce 24 Bushels to the Fraction of a Chaldron of Coals, *Facit* $\frac{2}{3}$.

17. Reduce 1 Pipe and 42 Gallons to the Fraction of a Tun of Wine. *Facit* $\frac{2}{3}$.

18. Reduce 3 Wks. 1 D. 9 H. 36 Ms. to the Fraction of a Month. *Facit* $\frac{4}{5}$.

19. Reduce 19 Hrs. 45 Ms. 52 Sds. $\frac{16}{17}$, to the Fraction of a natural Day. *Facit* $\frac{14}{17}$.

20. Reduce 2 Ors. 3 Nls. $\frac{1}{3}$, to the Fraction of a Yard. *Facit* $\frac{7}{10}$.

21. Reduce 30 Gal. $\frac{6}{7}$ to the Fraction of a Barrel of Beer. *Facit* $\frac{6}{7}$.

Thus ends Reduction of Fractions, the Knowledge of which is of universal Use in most Branches of Arithmetic.

ADDITION OF VULGAR FRACTIONS.

R U L E.

BRING all the Fractions to be added into a common Denominator, by Reduction; then add the Numerators into one Sum, and under that Sum place the common Denominator.

E X A M P L E S.

1. Add $\frac{1}{2}$ and $\frac{7}{8}$ together; the Sum is $\frac{11}{8}$, or $1\frac{3}{8}$.

2. Add $\frac{2}{3}$, $\frac{3}{4}$, and $\frac{4}{5}$ into one Sum. *Facit* $\frac{33}{60}$, or $2\frac{13}{20}$.

3. Add $\frac{1}{4}$, $\frac{1}{6}$, and $\frac{7}{8}$ into one Sum. *Facit* $\frac{31}{24}$, or $1\frac{7}{24}$.

4. Add $\frac{7}{8}$, $\frac{5}{6}$, and $\frac{11}{24}$ into one Sum. *Facit* $\frac{29}{24}$, or $1\frac{5}{24}$.

5. What is the Sum of $\frac{6}{7}$, $\frac{8}{9}$, and $\frac{3}{4}$. *Ans.* $\frac{1729}{882}$, or $1\frac{847}{882}$.

6. Add $\frac{2}{3}$ of $\frac{7}{8}$ and $\frac{2}{3}$ of $\frac{1}{3}$ into one Sum. *Facit* $\frac{109}{360}$, or $3\frac{1}{360}$.

Note. The Compound Fraction must be reduced to a Simple, and then add according to the Rule.

7. Add $\frac{2}{3}$, $\frac{3}{4}$, $\frac{5}{6}$, $\frac{7}{8}$, $\frac{11}{12}$, and $\frac{4}{15}$ into one Sum. *Facit* $\frac{3}{1}$.

S E C T I O N I.

To add FRACTIONS and INTEGERS together.

Rule. Add the Fraction as before directed, annexing their Sum to the Sum of the Integers.

8. Add $200\frac{1}{2}$, $99\frac{3}{4}$, $6\frac{5}{6}$, $\frac{4}{5}$, $59\frac{1}{4}$, and $11\frac{3}{20}$ into one Sum. *Facit* $371\frac{41}{60}$.

S E C T I O N II.

To add FRACTIONS of different DENOMINATIONS together.

Rule. Reduce them to one Denomination by the Rules in Reduction, and then add them as above directed.

9. Add $\frac{3}{4}$ of a Pound to $\frac{2}{8}$ of a Shilling. *Facit* $\frac{508}{640}$ of a Pound, or 15s. 10 $\frac{1}{2}$ d.

10. Add $\frac{7}{8}$ of a Shilling to $\frac{3}{4}$ of a Penny. *Facit* $\frac{15}{16}$ of a Shilling, or os. 11 $\frac{1}{4}$ d.

11. What is the Sum of $\frac{3}{4}$ of a Yard and $\frac{2}{3}$ of a Foot? *Answ.* $\frac{35}{36}$ of a Yard, or 2 Feet 11 Inches.

12. Add $\frac{5}{8}$ of a Mile to $\frac{3}{4}$ of a Yard. *Facit* $\frac{17509}{1120}$ of a Mile, or 6 fur. 26 Po. 4 Yds. 1 Ft. 4 In. $\frac{8}{11}$.

13. Add $\frac{3}{4}$ of a Quarter of Corn to $\frac{2}{3}$ of a Peck. *Facit* $\frac{37}{48}$ of a Quarter, or 6 Blh. 0 Pks. 1 Gal. 2 pts. $\frac{2}{3}$.

SUBTRACTION of VULGAR FRACTIONS.

RULE.

BRING the given Fractions into one Denominator, and subtract the lesser Number from the greater, placing the Remains over the common Denominator, which will be the Difference betwixt the given Fractions.

Proof by Addition.

EXAMPLES.

1. From $\frac{3}{5}$ take $\frac{1}{5}$, Remains $\frac{2}{5}$.
2. Subtract $\frac{1}{4}$ from $\frac{3}{4}$, Rest $\frac{1}{2}$.
3. What is the Difference between $\frac{3}{4}$ and $\frac{5}{12}$? *Answer* $\frac{1}{3}$.
4. If $\frac{5}{12}$ be deducted from $\frac{7}{9}$ what is the Excess? *Answ.* $\frac{23}{36}$.
5. From $\frac{7}{8}$ of a Pound take $\frac{6}{7}$ of a Pound. Remains $\frac{1}{56}$ of a Pound.
6. From $\frac{11}{15}$ take $\frac{3}{5}$, remains $\frac{2}{15}$.
7. From $\frac{108}{112}$ take $\frac{3}{4}$, remains $\frac{3}{14}$.
8. From $\frac{48}{56}$ take $\frac{4}{7}$, remains $\frac{16}{56}$ or $\frac{2}{7}$.
9. From 48 $\frac{2}{7}$ take 21 $\frac{2}{3}$, remains 26 $\frac{13}{21}$.
10. From 27 take $\frac{3}{7}$, remains 26 $\frac{4}{7}$.
11. From $\frac{2}{3}$ of 84 take $\frac{3}{4}$ of 22, remains 19 $\frac{1}{2}$.
12. From $\frac{108}{112}$ take $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{5}{6}$, remains $\frac{4416}{8064}$, or $\frac{23}{42}$.
13. From 30 $\frac{2}{7}$ take $\frac{16}{10}$, remains 29 $\frac{59}{133}$.
14. From 17 $\frac{1}{2}$ take $\frac{3}{4}$ of 22, remains 1.
15. From $\frac{3}{4}$ of a Pound take $\frac{7}{8}$ of a Shilling. *Facit* $\frac{453}{640}$ of a Pound, or 14s. 1 $\frac{1}{2}$ d.
16. From $\frac{2}{3}$ of a Shilling take $\frac{3}{4}$ of a Penny. *Facit* $\frac{37}{144}$ of a Shilling, or 7 $\frac{1}{4}$ d.
17. From $\frac{3}{4}$ of a Cwt. take $\frac{7}{12}$ of a Pound. *Facit* $\frac{4024}{3376}$ or 2qrs. 27lb. 6oz. 10drs. $\frac{2}{3}$.

18. From $\frac{7}{8}$ of a League take $\frac{3}{4}$ of a Mile. *Facit* $\frac{1}{24}$ or 1 Mile 7 Furlongs.

19. From 1 Ell take $\frac{7}{10}$ of a Yard. *Facit* $\frac{17}{100}$ or 1 Yd. 0 grs. 1 nl. $\frac{1}{5}$.

20. From $\frac{1}{2}$ of a Chaldron, take $\frac{2}{3}$ of a Bushel. *Facit* $\frac{104}{2100}$, or 17 Bshls. 1 Pk. $\frac{1}{3}$.

21. From 14 Weeks take 19 Days $\frac{4}{15}$. *Facit* 11 Weeks, 1 Day $\frac{1}{15}$.

MULTIPLICATION of VULGAR FRACTIONS.

R U L E.

MULTIPLY the Numerators together for a new Numerator, and the Denominators for a new Denominator.

E X A M P L E S.

1. Multiply $\frac{3}{4}$ by $\frac{2}{3}$. *Facit* $\frac{6}{12}$ or $\frac{1}{2}$.

2. What is the Product of $\frac{7}{8}$ multiplied by $\frac{3}{4}$? *Ans.* $\frac{21}{32}$.

3. If $\frac{1}{2}$ of $\frac{5}{6}$ be multiplied by $\frac{2}{3}$, what is the Product? *Ans.* $\frac{1}{6}$.

4. Multiply $\frac{3}{4}$ of $\frac{2}{3}$ by $\frac{1}{2}$ of $\frac{2}{3}$. *Facit* $\frac{1}{10}$.

Note 1. Reduce your Compound Fractions to simple and mixt Numbers to improper Fractions, and the preceding Rule is general.

2. As whole Numbers, multiplied by whole Numbers, do increase the Product, so proper Fractions multiplied by proper Fractions, do diminish the Product; or, which is the same Thing, decreases it in the same Proportion as the multiplying Fraction is to Unity.

5. Multiply $\frac{3}{7}$ by $\frac{9}{11}$. *Facit* $\frac{27}{77}$.

6. Multiply $\frac{3}{5}$ by $\frac{4}{9}$. *Facit* $\frac{12}{45}$.

7. Multiply $\frac{2}{3}$ of $\frac{3}{9}$ by $\frac{7}{8}$ of $\frac{1}{12}$. *Facit* $\frac{462}{4592}$, or $\frac{77}{732}$.

8. Multiply $9\frac{1}{4}$ by $4\frac{1}{2}$. *Facit* $3\frac{3}{8}$, or $41\frac{5}{8}$.

9. Multiply $7\frac{5}{8}$ by 4. *Facit* $2\frac{4}{8}$, or $30\frac{1}{2}$.

10. Multiply $12\frac{1}{4}$ by $6\frac{1}{2}$. *Facit* $6\frac{6}{8}$, or $82\frac{7}{8}$.

The following Questions are the same as in Mensuration.

11. If a Board Plank be 12 Feet 9 Inches long, and 6 Feet 6 Inches broad, what is the superficial Content? *Ans.* $82\frac{7}{8}$ Feet; or when the Fraction is valued it will be 82 Feet, 10 Inches, 6 grs.

12. Suppose a Plank be $\frac{3}{5}$ of 16 Feet long, and $\frac{7}{8}$ of 10 Feet broad, what is the superficial Content? *Ans.* 84 Feet.

13. If a Room be 16 Feet, 7 Inches long, and 12 Feet 5 Inches broad, what is the superficial Content? *Ans.* 205 Feet, 10 Inches, 11 P. So that by these we see that all Questions in Cross Multiplication may be performed by Multiplication of Fractions, and sometimes more concise.

DIVISION of VULGAR FRACTIONS.

WHEN the Divisor and Dividend are both simple Fractions, or reduced to such, then multiply the Numerator of the Dividend by the Denominator of the Divisor for a new Numerator, and the Denominator of the Dividend, by the Numerator of the Divisor for a new Denominator; which new Fraction will be the required Quotient:

Or, invert your Divisor, and proceed as in Multiplication, and the Products will be the Quotient, as before, which I think the best.

Multiplication and Division mutually prove each other.

EXAMPLES.

1. Divide $\frac{2}{3}$ by $\frac{3}{4}$, place it thus $\frac{2}{3} \div \frac{3}{4}$, *Facit.*
Or thus, inverting your Divisor it will stand thus $\frac{4}{3} \div \frac{2}{3}$.
2. Divide $\frac{4}{5}$ by $\frac{3}{4}$. *Facit* $\frac{16}{15}$ or $1 \frac{1}{15}$.
3. Divide $\frac{1}{2}$ by $\frac{1}{2}$. *Facit* $\frac{2}{2}$ or $1 \frac{0}{6}$.
4. Divide $\frac{2}{3}$ by $\frac{3}{4}$. *Facit* $\frac{8}{9}$ or $1 \frac{1}{9}$.
5. Divide $\frac{1}{2}$ by $\frac{6}{12}$. *Facit* $\frac{12}{12}$ or $1 \frac{0}{6}$.
6. Divide $\frac{7}{8}$ by $\frac{6}{8}$. *Facit* $\frac{56}{48}$ or $1 \frac{1}{6}$.
7. Divide $\frac{3}{8}$ by $\frac{1}{4}$. *Facit* $\frac{12}{8}$ or $1 \frac{1}{2}$.
8. Divide 7 by $\frac{3}{4}$. *Facit* $\frac{28}{3}$ or $9 \frac{1}{3}$.
9. Divide $8 \frac{3}{4}$ by $\frac{3}{4}$. *Facit* $\frac{140}{12}$ or $2 \frac{1}{3}$.
10. Divide $20 \frac{1}{5}$ by $9 \frac{1}{8}$. *Facit* $\frac{808}{365}$ or $2 \frac{78}{365}$.
11. Divide 7 of $\frac{2}{9}$ by 9 of $\frac{1}{11}$. *Facit* $\frac{154}{81}$ or $1 \frac{7}{9}$.

In Part of the foregoing Examples, when the Dividend and Divisor have one common Denominator, or may be reduced to one; reject the Denominator and divide the Numerator of the Dividend, by the Numerator of the Divisor, and it gives the *Answer*.

The

The RULE of THREE DIRECT in VULGAR FRACTIONS.

THE Rule of Three in Fractions is performed the very same as in whole Numbers.

EXAMPLES.

1. If $\frac{7}{8}$ of a Yard of Cloth cost $\frac{3}{4}$ of a Pound, what will $\frac{2}{3}$ of a Yard cost? *Ans.* $\frac{4}{8}$ of a Pound, or 11s. 5d. $\frac{1}{7}$.
2. If $\frac{2}{3}$ of a Pound of Sugar cost $\frac{4}{7}$ of a Pound, what will $\frac{7}{8}$ of a Pound cost? *Ans.* $\frac{8}{112}$ of a Pound, or 15s.
3. If $\frac{3}{40}$ of a Yard cost $\frac{2}{3}$ of a Pound, what will $\frac{5}{8}$ of a Yard cost at that Price? *Ans.* $\frac{40}{34}$ of a Pound, or 14s. 9d. $\frac{3}{4}$.
4. If $\frac{5}{6}$ of a C. cost $\frac{20}{27}$ of a Pound, what will $\frac{3}{4}$ of a C. cost? *Ans.* $\frac{360}{54}$, or 13s. 4d.
5. If $\frac{1}{2}$ of a Yard cost $\frac{6}{5}$ of a Pound, what will $\frac{1}{2}$ of a Yard cost? *Ans.* $\frac{72}{45}$, or 1l. 12s. 8d. $\frac{1}{11}$.
6. If $\frac{1}{2}$ of a Yard cost $\frac{18}{11}$ of a Pound, what will $\frac{1}{2}$ of a Yard cost? *Ans.* $\frac{6}{2}$, or 3 Pounds.
7. If $\frac{7}{8}$ of a Pound of Sugar cost $\frac{3}{4}$ of a Shilling, how much Sugar will $\frac{8}{9}$ of a Shilling buy at the same Rate? *Ans.* 1 lb. $\frac{1}{27}$.
8. If $\frac{9}{10}$ of a C. cost 3l. 11s. what cost 7 C. $\frac{1}{2}$? *Answer.* $\frac{963}{36}$, or 29l. 11s. 8d.
9. If 7 $\frac{1}{2}$ Cwt. cost $\frac{965}{38}$ of a Pound, what will $\frac{9}{10}$ of Cwt. cost? *Ans.* $\frac{71}{6}$, or 3l. 11s.
10. If $\frac{2}{3}$ of $\frac{1}{4}$ of a Pound Weight cost $\frac{52}{168}$ of a Pound, what cost the C. Weight at that Price? *Ans.* $\frac{11648}{168}$ or 43l. 9s. 3d. $\frac{3}{7}$.
11. If one Cwt. cost $\frac{11648}{168}$ Pounds, what will $\frac{2}{3}$ of $\frac{3}{4}$ of a Pound Weight of the same cost? *Answer.* $\frac{52}{168}$ of a Pound, or 6s. 2d. $\frac{5}{7}$.
12. A Wine Merchant laid out 785l. $\frac{3}{8}$ in Madeira Wine, at 5s. $\frac{7}{8}$ per Gallon, pray what Quantity did he buy in? *Ans.* 2673 $\frac{29}{7}$ Gallons.
13. A Plumber bought 7 $\frac{1}{2}$ Fodders of Lead, each weighing 19G $\frac{1}{2}$, at 3d $\frac{7}{8}$ per Pound, I demand the Value? *Answer.* 264l. 9s. 4d. $\frac{1}{2}$.
14. A Draper laid out 176l. 19s. $\frac{5}{8}$ in 15 Pieces of Bag Holland, at 4s. 9d. $\frac{2}{3}$ per Ell *Flemish*, I demand how many *English* Ells did each Piece contain? *Ans.* 29 $\frac{3}{4}$.

15. If $\frac{3}{4}$ of $\frac{5}{6}$ of a Hundred Weight less $\frac{3}{4}$ cost 2 l. $\frac{7}{8}$, what must I pay for 5 Cwt. less $\frac{1}{4}$ of 2 C. $\frac{1}{2}$? *Answer.* 49 l. 0 s. 1 d. $\frac{1}{4}$ $\frac{5}{11}$.

SINGLE RULE INVERSE in FRACTIONS.

THIS is the same as Whole Numbers, to which Rule I refer to work the following Examples.

1. Suppose one lends $\frac{3}{4}$ of 100 l. $\frac{7}{8}$ of a Year, how long ought he to lend me $\frac{5}{12}$ of the same to requite the former Favour? *Answer* $\frac{63}{8}$ of a Year, or 12 Months, 2 Weeks, 2 Days, $\frac{4}{5}$.

2. If $6\frac{1}{2}$ Yards of Cloth, 2 Yards wide, will cover a Table, how many Yards will cover the same Table when the Cloth is $\frac{1}{2}$ Yard Wide? *Answer* $5\frac{1}{2}$, or 26 Yards.

3. If one lends 92 Pounds $\frac{4}{10}$ of a Year, how much ought he to lend me $\frac{7}{14}$ of a Year? *Answer.* $4\frac{1}{3}$ or 126 $\frac{6}{11}$.

4. If one lends 126 $\frac{6}{11}$ Pounds $\frac{7}{14}$ of a Year, what Sum ought he to lend $\frac{4}{10}$ of a Year? *Answer.* 92 Pounds.

5. If 12 Men can mow $24\frac{1}{2}$ Acres in $10\frac{2}{3}$, in what Time will 6 Men do the same? *Answer.* $21\frac{1}{3}$ Days.

6. If 6 Men mow $24\frac{1}{2}$ Acres in $21\frac{1}{3}$ Days, in what Time will 12 Men do the same? *Answer.* $10\frac{2}{3}$ Days.

7. I have a Room that is $108\frac{2}{3}$ Feet round, and $13\frac{2}{3}$ Feet high, which I have a mind to line with Paper that is $1\frac{1}{2}$ Foot wide, I demand how many Yards will cover the said Room? *Answer.* 276 yds. 2 ft. $\frac{62}{145}$.

The DOUBLE RULE of THREE in VULGAR FRACTIONS.

The same as Whole Numbers.

EXAMPLES.

1. If 10 Men in 20 Days spend $33\frac{1}{3}$ Pounds, what will 74 Men spend in $92\frac{1}{2}$ Days? *Answer.* $1140\frac{1}{2}$ Pounds.

2. If 8 Men in 7 Days earn $9\frac{3}{8}$ Pounds, what will 56 Men earn in $21\frac{1}{2}$ Days? *Answer.* $200\frac{3}{4}$ Pounds.

3. A person by repeated Experience found that his Family, consisting of 10 Persons, did drink $\frac{5}{9}$ of a Hhd. of Wine in 7 Days; but they being increased to 35 in Family, how much wine must he have to serve them one Month, or 28 Days? *Answer.* $7\frac{1}{2}$ Hbds.

4. Twelve Gentlemen, with each a Servant, being upon a Party of Pleasure, found their Expences in 9 Days amounted to $120\frac{3}{4}$ Pounds; but being joined in company with 42 more, with each a Servant, they agreed to continue together 38 Days, what Sum will defray their Expences after this Meeting? *Answer* $2462\frac{2}{3}$ Pounds.

5. Suppose the Wages of 7 Men $\frac{3}{4}$ of a Month be $18\frac{3}{8}$ Pounds, what time must 35 Men serve for 420 Pounds? *Answer* 3 Months, 1 Week, 5 Days.

6. If the Wages of 12 Men $\frac{1}{3}$ of a Year be $11\frac{1}{5}$ Pounds, what Number of men may be employed one Year or 52 Weeks for $5405\frac{2}{3}$ Pounds? *Answer* 108 Men.

7. A Gentleman bought $25\frac{3}{4}$ Yards of broad Cloth, and $39\frac{5}{8}$ Yards of Shalloon, to make him and his Children Cloaths; the Cloth was $1\frac{5}{8}$ Yard wide, and the Shalloon $\frac{7}{8}$ of a Yard wide; but changing his Mind, he would have the Cloth $1\frac{2}{3}$ wide, and the Shalloon $\frac{3}{5}$ of a Yard wide; how much will be equal to the Quantity he first mentioned? *Answer*. Cloth $52\frac{3}{8}$, the Shalloon $57\frac{7}{8}$.

NOTATION of DECIMAL FRACTIONS.

THE Denominator of a Decimal Fraction is not expressed, but understood, and is an Unit with as many Cyphers annexed, as there are Places in the Numerator. So $\frac{5}{10}$ is expressed thus ,5, and $\frac{75}{100}$ thus ,75, and $\frac{625}{1000}$ thus ,625; the Point or Comma is prefixed to distinguish them from whole Numbers.

Note. Cyphers placed to the left Hand of Integers and to the right Hand of Decimals, neither increaseth or decreaseth their Value, as 8, 08, 008, these being Integers do still retain the same value.

And ,7 ,70 ,700, these being Decimals do retain the same Value, each being 7 Parts when Unity is divided into ten Parts.

But Cyphers placed to the right Hand of an Integer increaseth its Value, and to the left Hand of a Decimal decreaseth its Value; as:

,3 is Three Tenth Parts

,03 is Three Hundred Parts

,003 is Three Thousand Parts

,0003 is Three Ten Thousand Parts

,00003 is Three Hundred Thousand Parts.

By

By the above you may observe, Decimal Fractions do decrease in ten fold Proportion to the Right Hand, as whole Numbers increase to the Left Hand.

ADDITION OF DECIMALS.

IS the same as whole Numbers, seeing every Place towards the Right Hand is ten times greater than that which is next towards the Right Hand; as appears by Notation.

Rule. Add the several Sums into one, the same as in whole Numbers. Then distinguish the Decimal Places, by pointing of as many Places towards the left Hand, as are found Decimals in any one Line you have to add.

EXAMPLES.

<i>Pounds.</i>	<i>Shillings.</i>	<i>Yards.</i>	<i>Ounces.</i>
14,672	237,146	2743,1076	482,6351
37,281	723,674	3615,2157	25,2534
76,3146	216,78432	3612,1346	152,7381
752,432	671,362	2137,276	9,6815
673,124	814,276	5721,0047	31,7215
		3137,0461	12,71,10
1553,8236		3147,0706	,43,2185
			2,31,7428

<i>Acres.</i>	<i>Gallons.</i>	<i>Pence.</i>	<i>Farthings.</i>
215,27	1,235162	7003,2835	68121,10
468,315	,327145	601,0031	5327,213
72,274	,2823	9,17821	281,6245
183,561	,764	321,0105	126,21
2151,24	,231	,9821	41230,0001
7,12371	,731	725,001	235,71
15,2152	,231	63,2152	60,423
275,134	,31467	91,760237	2131,715

SUBTRACTION OF DECIMAL FRACTIONS,

IS the same as whole Numbers, only mind to place Units under Units in whole Numbers, and Tenths under Tenths in Decimal Parts.

EXAMPLES.

	£	Yards.	Ells.	Years.
From	274,372	574,040	371,047	274,037
Take	196,6742	197,9875	197,3147	198,476
Rest	77,6978			
Proof	274,3720			
	Days.	Tuns.	Hbds.	Minutes.
From	631,21	247,	713,6215	23154,
Take	29,3215	,835	20,0091	6,70151

MULTIPLICATION OF DECIMALS.

PLACE the Factors, and work as in whole Numbers, but observe to separate as many Places of Decimals on the Right Hand of the Product, as there are in both the Factors, and if there be not so many, the Defect must be supplied with a Cypher or Cyphers towards the Left Hand.

EXAMPLES.

1. Multiply 4,29 by ,57. Product 2,4453
2. Multiply ,046 by ,42. Product ,01932
3. Multiply 3,745 by ,074
4. Multiply 2,764 by 3,745
5. Multiply 57,64 by 3,25
6. Multiply 67,425 by ,25
7. Multiply 37,425 by 4,753
8. Multiply 27,6314 by ,00007
9. Multiply 37,145 by 2,745
10. Multiply 2,7437 by 2,145

D I V I S I O N O F D E C I M A L S .

THIS is the same with that of whole Numbers till the Work be done ; then cut off so many Decimal Places in the Quotient as the Dividend has more than the Divisor ; if there be not so many, supply the Defect with Cyphers towards the Left Hand.

E X A M P L E S .

1. Divide 2,4453 by ,57 *Facit* 4,29
2. Divide ,01932 by ,42 *Facit* ,046
3. Divide 1141,875 by 1,75 *Facit* 652,5

Note, Sometimes it is necessary to place Cyphers to the Right Hand of the Divided, and then consider how many Decimal Places you would have in the Quotient, and how many there are in the Divisor ; and make so many in the Dividend as in both.

4. Divide 5729 by 438, and to have four Places of Decimals in the Quotient, it will then stand thus,
438)5729,0000(13,0799. *&c.*

As there are no Decimals in the Divisor, but there are 4 in the Dividend, then there must be 4 in the Quotient, according to the Rule.

5. Divide 47,237 by 2,73
6. Divide 67,394 by 27,4
7. Divide 673,2414 by 72,94
8. Divide 674,3219 by 76,43
9. Divide 572,56 by ,125
10. Divide 6737,6452 by ,25

R E D U C T I O N O F D E C I M A L S .

TEACHES to Reduce a Vulgar Fraction to a Decimal, equivalent to the same in Value.

Rule. Annex Cyphers to the Numerator, and divide by the Denominator, and the Quotient will be the Decimal required.

E X A M P L E S .

1. Reduce $\frac{3}{4}$ to a Decimal. *Facit* ,75.
2. Reduce $\frac{1}{2}$ to a Decimal. *Facit* ,5.

3. Reduce $\frac{1}{4}$ to a Decimal. *Facit* ,25.
 4. Reduce $\frac{1}{2}$ of $\frac{1}{12}$ to a Decimal Fraction. *Facit* ,041666.
 5. Reduce $\frac{3}{4}$ of $\frac{1}{12}$ to a Decimal Fraction. *Facit* ,0625.

SECTION I.

When a simple Number is proposed, divide as in Reduction of Integers; but when the given Parts are of divers Denominations, reduce them into their lowest Name, and divide them as before; or thus:

Reduce the lowest into Decimals of the next superior Name, and let the given Parts of the next superior Denomination be placed on the right Hand of the Decimals found; and so proceed, still dividing the Product by the next superior Denominator, till you have brought out the Decimal Parts of the highest Integer.

Note, This last Method (in my Opinion) is much preferable to any other.

EXAMPLES.

6. Reduce 7 s. to the Decimal of a Pound. *Facit* ,35.
 7. Reduce 17 s. to the Decimal of a Pound. *Facit* ,85.
 8. Reduce 3 Inches to the Decimal of a Foot. *Facit* ,25.
 9. Reduce 8 Inches to the Decimal of a Foot. *Facit* 66666.
 10. Reduce 17s. 6d. to the Decimal of a Pound. *Facit* ,875.
 11. Reduce 15s. 8 $\frac{1}{4}$ d. to the Decimal of a Pound. *Facit* ,786458.

s.	d.	First
15	8 $\frac{1}{4}$	
12		
188		
4		

960)755(,786458

	Second.
4	3,00
12	8,75
20	15,72916
	,786458

12. Reduce 12s. 2 $\frac{1}{2}$ d. to the Decimal of a Pound. *Facit* ,610415.

4	2,0
12	2,5
2 0	12,2083
	,610415

13. Reduce 19s. 3 $\frac{1}{4}$ d. to the Decimal of a Pound. *Facit* 9635415.

4	1,0
12	3, 25
20	19,27083
	,9635415

72 *Reduct. of Decimals.*

ACCOMPTANT'S

14. Reduce 17s. 4 $\frac{3}{4}$ d. to the Decimal of a Pound.
Facit ,8697915.

4		3,0
12		4,75
20		17,39583
		,8697915

15. Reduce 6 $\frac{3}{4}$ d. to the Decimal of a Shilling. *Facit* ,5625.

4		3,0
12		6,75
		,5625

16. Reduce 12lb. to the Decimal of an Cwt. *Facit* ,1071420.

17. Reduce 2qrs. 14lb. to the Decimal of an Cwt. *Facit* ,625.

18. Reduce 24 yds. to the Decimal of a Mile. *Facit* ,013637.

19. Reduce 2 Rds. 16 Per. to the Decimal of an Acre. *Facit* ,6.

20. Reduce 7 Gallons of Ale to the Decimal of an Hhd. *Facit* ,14583.

21. Reduce 8 Minutes to the Decimal of a Day. *Facit* ,00555.

22. Reduce 35 Days 4 Hours to the Decimal of a Year. *Facit* ,096347.

SECTION II.

To find the Value of a DECIMAL FRACTION.

Rule. Multiply the Decimal by the Parts of the Integer, and cut off so many Places to the Right Hand as your Decimal consists of, and those to the Left will be Integers of the next inferior Denomination.

EXAMPLES.

1. What is the Value of ,41875 of a Pound? *Answer* 8s. 4 $\frac{1}{2}$ d.

2. What is the Value of ,421875 of a Pound? *Answer* 8s. 5 $\frac{1}{4}$ d.

3. What is the Value of ,484374 of a Pound? *Answer* 9s. 8 $\frac{1}{2}$ d.

4. What is the Value of ,585 of a Shilling? *Answer* 7d.

5. What is the Value of ,75 of a Shilling? *Answer* 9d.

6. What is the Value of ,3134 of a lb. Troy? *Answer* 6cz. 3drs. 5gr.

7. What is the Value of ,875 of an Cwt. *Answer* 3 qrs. 14 lbs.
8. What is the Value of ,45 of a Yard? *Answer* 1 qr. 3 nls.
9. What is the Value of ,625 of a Barrel of Beer? *Answer* 22 gal. 2 qrs.
10. What is the Value of ,3645 of a Pipe of Wine? *Answer* 45 gal. 3 qrs. 2 pts.
11. What is the Value of ,5634 of an Ell *Flemish*? *Answer* 1 qr. 3,9 nls.
12. What is the Value of ,2875 of a Furlong? *Answer* 11 P. 2 Yds. 2 Ft. 3 In.
13. What is the Value of ,365 of an Acre? *Answer* 1 R. 18 P. 2 Yds.
14. What is the Value of ,6354 of a Foot? *Answer* 7 In. ,68 B.
15. What is the Value of ,846 of a League? *Answer* 2 M. 4 F. 12 P.
16. What is the Value of ,28865 of a Chaldron of Coals? *Answer* 10 Bshs. 2 Pks.
17. What is the Value of ,5836 of a Day? *Answer* 14 Hours.
18. What is the Value of ,48375 of a Year? *Answer* 6 M. 8 D. 2 H.

THE RULE of THREE in DECIMALS.

WHEN you have stated your Question, Observe, the Rules given in Multiplication and Division of Decimals, and it differs nothing from this Rule in whole Numbers.

EXAMPLES.

1. If 9,85 lb. of Sugar cost 8,25 l. what cost 3,25 C? *Ans.* 28 l. 15 s. 11 1/2 d. ,08.
2. If a Person in one Week, or 7 Days, saves 3,85 l. what will he save in one Year? *Answer* 200,75 Pounds or 200 l. 15 s.
3. If 7 Yards of Holland cost 4,746857 Pounds, what will 365 Yards cost? *Answer* 247,51469 Pounds, or 247 l. 10 s. 3 1/2 d.

4. If ,75 of a Yard cost ,15 of a Pound, what will 627,25 Yards cost? *Ans.* 125,45*l.* or 125*l.* 9*s.*

5. If 5,25 Pounds of Tobacco cost 10,5 Shillings, what will 978,75 Pounds cost at that Rate? *Ans.* 1957,5*s.* or 97*l.* 17*s.* 6*d.*

6. A Man bought a Puncheon of Rum for 29*l.* 18*s.* ,75, I demand how he must sell it *per* Gallon so as to gain 15*l.* 10*s.* ,25? *Ans.* 1*s.* 9*d.* 3,4.

7. If 7 Yards of Cloth cost ,05 Pound, what will 9125 Yards cost at that Price? *Ans.* 65*l.* 3*s.* 6*d.* ,336.

8. Laid out for a Piece of Cloth 19,57*l.* I demand how many *English* Ells there were in the same, when I gave after the Rate of 12,25*s.* *per* Yard? *Answer* 25,56.

9. A Wine Merchant bought a Pipe of Mountain Wine for 35,27*l.* but had the Misfortune to lose 49,56 Gallons, I demand how he must sell the Remainder *per* Gallon, so as to be no loser? *Ans.* 9*s.* 2*d.* 2,944.

10. Bought, a Quantity of Malt for 107,75*l.* and sold it out at 27,25*s.* *per* Quarter, by which I gained 9,28*l.* pray what Quantity did I first buy in? *An.* 85*qrs.* 7,148*bs.*

11. Ship'd from Virginia 5 Hhds of Tobacco, each weighing 3*C.* 3*qrs.* 22,75*lb.* which cost me 6,25*l.* *per* *Cwt.* and I sold it out again at 1,45*s.* *per* *lb.* what did I gain or lose by the Sale thereof? *Ans.* Gained 36*l.* 19*s.* 1½*d.* 76.

12. Suppose a Ship of war carries 573 Sailors and they expend 146,25 Pecks of Peas in 91,275 Days, I require how long 1561,3 Pecks will last a ship that carries 954 Sailors, allowing the month to be 28 Days. *Ans.* 1 *Yr.* 7 *Mos.* 25 *Ds.* 2637.

13. Suppose a Family of 23 Persons do drink out 112,32 Gallons of Beer in 29,42 Days, I require how many Gallons of Beer will be drank in 91,25 Days by another Family consisting of 33 Persons? *Answer* 9 Hhds. 13,84 Gallons.

14. Suppose a Tax of 500,72*l.* to be laid on a Parish for the Building of a Church, and the Value of the Parish Rent is 3171,71*l.* *per* *Ann.* what must a Parishioner pay, whose Estate is worth 200,171 *per* *Ann.*? *Ans.* 31*l.* 12*s.* 7*d.* 3,296.

15. A Builder agreeing with a Smith for 30 Feet of Iron Railing at 30*s.* *per* Hundred Weight, which came to 9,68*l.* but giving farther Orders for 34 Feet of Iron Railing, in the same Proportion, I desire to know the Weight and what the Expence will be? *Ans.* Weight 7*C.* 1*qr.* 7,134*lb.* Expence 10*l.* 19*s.* 4*d.* 2,776.

16. A young Gentleman came to an Estate of 1200*l.* *per Annum*, the Expences of his Family were 12,78*l.* *per Week*, his Ground Rent, and Repairs of his Estate 150,75 *per Ann.* to a Widow's Jointure 15*l.* 25 to be paid Quarterly, allowing himself 5,36*s.* *per Day* for private Expences, I desire to know how much he saved at the Year's End?
Ans. 225*l.* 17*s.* 4*d.* 3,2.

I N T E R E S T.

Is either Simple or Compound.

O F S I M P L E I N T E R E S T . .

S I M P L E Interest is the Premium allowed by the Borrower to the Lender upon the Principal only, for a proposed Space of Time.

The Sum of Money lent, on which Interest is allowed, is called the Principal or Stock.

The Amount is the Principal and Interest added together.

The Rate *per Cent.* is a certain Sum of Money agreed on between the Borrower and the Lender to be paid for every 100*l.* for the Use of the Principal one Year or twelve Months.

Note. The Rules of Interest are also applied to Commission, Brokerage, purchasing of Stocks, Insurances, or any thing else rated at so much *per Cent.*

S E C T I O N I.

To find the Interest for a Year.

Rule. Multiply the Principal by the Rate, and divide by 100, and the Quotient will be the Interest required.

For several Years.

Multiply the Interest of one Year by the Number of them, and the Product will be the Answer.

E X A M P L E S .

1. What is the Interest of 355*l.* for one Year at 4 *per Cent.* *per Ann.*? *Ans.* 14*l.* 4*s.*

H 2.

355

$$\begin{array}{r}
 355 \\
 4 \\
 \hline
 14 \overline{)20} \\
 20 \\
 \hline
 4 \overline{)00}
 \end{array}$$

$$\begin{array}{r}
 355 \\
 ,04 \\
 \hline
 14,20 \\
 20 \\
 \hline
 4,00
 \end{array}$$

2. What is the Interest of 522*l.* 10*s.* for a Year, at $4\frac{1}{2}$ per Cent. per Ann? *Answer*, 23*l.* 10*s.* 3*d.*

3. What is the Interest of 725*l.* 16*s.* 4*d.* at 5 per Cent. per Ann. for 4 Years? *Answer*, 145*l.* 3*s.* 3*d.* ,2.

4. What is the Amount of 921*l.* 17*s.* 6*d.* at $5\frac{1}{2}$ per Cent. per Ann for 7 Years? *Answer*, 1276*l.* 15*s.* 11*d.*

5. What is the Interest of 479*l.* 12*s.* 3*d.* at $5\frac{1}{4}$ per Cent. per Ann. for 9 Years? *Answer*, 248*l.* 3*s.* 11*d.* ,89.

OF FACTORAGE.

Factorage, Provision, or Commission, is a Premium allowed by the Merchants to their Factors or Correspondents, for the Purchasing or Vending of any Kind of Goods, and is commonly at a certain Rate per Cent. according to the Custom of the Country where the Factor resides.

6. What comes my Factor's Commissions to at 3 per Cent. upon 424*l.* 10*s.* disbursed on my Account? *Answer* 12*l.* 14*s.* 8*d.* ,6

7. By Advice from my Factor, I am informed that he has bought Goods on my Account to the Value of 735*l.* 14*s.* $3\frac{1}{2}$ *d.* what comes his Commission to at $2\frac{1}{4}$ per Cent? *Answer*, 16*l.* 11*s.* 0*d.* ,34.

8. Suppose I allow my Correspondent $3\frac{1}{4}$ per Cent. for his Commission, what is his Demand on the Disbursement of 923*l.* 7*s.* $8\frac{1}{2}$ *d.*? *Answer*, 30*l.* 0*s.* $2\frac{3}{4}$ *d.* 62.

9. What must I allow my Correspondent for laying out on my Account 875*l.* 12*s.* at $2\frac{1}{2}$ per Cent? *Answer*, 21*l.* 17*s.* 9*d.* 2, 4.

Purchasing of Stocks.

Rule. Multiply the Sum to be purchased by the over-plus above 100, and divide that Product by 100, to which Quotient add the given Sum, and the Total will be the Purchase required.

When

When under *Par*, multiply by the Rate *per Cent.* and divide by 100, that Quotient will be the Purchase.

EXAMPLES.

1. At $133\frac{1}{2}$ *per Cent.* India Stock, what is the Purchase of 673*l.* 10*s*? Answer 899*l.* 2*s.* $5\frac{1}{4}$ *d.* 6.

$$\begin{array}{r} 2 \overline{) 673} \quad 10 \\ \underline{ 8} \end{array}$$

$$\begin{array}{r} 5388 \quad 0 \\ \underline{ 4} \end{array}$$

$$\begin{array}{r} 21552 \quad 0 \\ 673 \quad 10 \\ \underline{336} \quad 15 \end{array}$$

$$\begin{array}{r} 225 \overline{) 62} \quad 5 \\ \underline{20} \end{array}$$

$$\begin{array}{r} 12 \overline{) 45} \\ \underline{12} \end{array}$$

$$\begin{array}{r} 5 \overline{) 40} \quad 225 \quad 12 \quad 5 \\ \underline{673} \quad 10 \quad 0 \\ 1 \overline{) 60} \quad 899 \quad 2 \quad 5 \end{array}$$

By Decimals.

$$\begin{array}{r} 673,5 \\ \underline{33,5} \end{array}$$

$$\begin{array}{r} 33675 \\ \underline{20205} \\ 20205 \end{array}$$

$$\begin{array}{r} 225,6225 \\ \underline{673,5} \end{array}$$

$$\begin{array}{r} 899,1225 \\ \underline{20} \end{array}$$

$$\begin{array}{r} 2,4500 \\ \underline{12} \end{array}$$

$$\begin{array}{r} 5,40 \\ \underline{4} \\ 1,6 \end{array}$$

2. When *South Sea* Annuities are at $105\frac{1}{2}$ *per Cent.* what must I pay for the Purchase of 2112*l.* 14*s*? Answer 2228*l.* 17*s.* 11*d.* 2,5.

3. At $110\frac{3}{4}$ *per Cent.* *South Sea* Old Annuities, what is the Purchase of 1679*l.* 16*s*? Answer, 1854*l.* 1*s.* 6*d.* 3,6.

4. What is the Purchase of 325*l.* 14*s.* consolidated Bank Annuities at $93\frac{1}{2}$ *per Cent*? Answer, 304*l.* 10*s.* 7*d.* 08.

5. Bought *South-Sea* Stock at $83\frac{1}{2}$, what did I pay for the Purchase of 987*l.* 10*s*? Answer, 825*l.* 15*s.* 11*d.*

6. What comes the Purchase to of 1798*l.* 15*s.* Bank Stock at $123\frac{1}{2}$ *per Cent*? Answer, 2228*l.* 4*s.* 0*d.* 1,5.

B R O K A G E

Is the Profit allowed to Brokers at a certain Rate *per Cent.* for assisting Merchants or Factors in the buying or disposing of their Goods.

Rule. Divide the given Sum by 100, and from the Quotient take the Parts with the Rate *per Cent.*

E X A M P L E S.

1. What is the Brokage of 975*l.* 10*s.* at 4*s.* *per Cent* ?
Ans. 1*l.* 19*s.* 02

$$\begin{array}{r}
 975 \quad 10 \frac{1}{2} \quad 9 \quad 15 \quad 1 \\
 \underline{20} \\
 15 \overline{) 10} \\
 \underline{12} \\
 1 \overline{) 2}
 \end{array}$$

By Decimals

$$\begin{array}{r}
 975.5 \\
 ,002 \\
 \hline
 1,9510 \\
 20 \\
 \hline
 19,02
 \end{array}$$

2. What must I give my Broker when he sells Goods to the Value of 1846*l.* 14*s.* 6*d.* and I allow him 2*s.* 6*d.* *per Cent* ? *Answer,* 4*l.* 12*s.* 4*d.*

3. Suppose I allow my Broker 4*s.* 6*d.* *per Cent.* for Brokage, what may he demand when he sells Goods to the Value of 798*l.* 15*s.* 6*d.* ? *Answer,* 3*l.* 11*s.* 10*d.* 2,7.

4. If a Broker is employed to buy Goods to the Value of 1273*l.* 17*s.* 6*d.* what will be his Demand at 5*s.* 6*d.* *per Cent* ? *Answer* 7*l.* 0*s.* 1 $\frac{1}{2}$ *d.*

S E C T I O N. II.

If the Time is $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, besides the Number of Years given, then take the Parts of one Year's Interest and add to the Interest of the rest of the Time, and that Sum will be the Answer.

E X A M P L E S.

1. What is the Interest of 973*l.* 11*s.* 7*d.* at 6 *per Cent.* *per Ann.* for two Years $\frac{3}{4}$? *Answer.* 160*l.* 12*s.* 9 $\frac{1}{2}$ *d.* 9.

COMPANION.

$$\begin{array}{r}
 973 \quad 11 \quad 7 \\
 6 \\
 \hline
 58 \overline{) 41} \quad 9 \quad 6 \\
 20 \\
 \hline
 8 \overline{) 29} \\
 12 \\
 \hline
 3 \overline{) 54} \\
 4 \\
 \hline
 2 \overline{) 16} \\
 \hline
 2 \overline{) 58 \text{ l. } 8 \text{ s. } 3 \frac{1}{2} \text{ d.}} \\
 2 \\
 \hline
 2 \overline{) \begin{array}{ccc} 116 & 16 & 7 \\ 29 & 4 & 1 \frac{3}{4} \\ 14 & 12 & 0 \frac{3}{4} \end{array}} \\
 \hline
 160 \quad 12 \quad 9 \frac{1}{2}
 \end{array}$$

Simple Interest. 79

By Decimals.

$$\begin{array}{r}
 973,579 \\
 ,06 \\
 \hline
 58,41474 \\
 2,75 \\
 \hline
 29207370 \\
 40890318 \\
 11682948 \\
 \hline
 160,640535 \\
 20 \\
 \hline
 12,8107 \\
 12 \\
 \hline
 9,7284 \\
 4 \\
 \hline
 2,9136
 \end{array}$$

2. What is the Interest of 579 l. 12s. 4d. at 3 per Cent. per Ann. for 5 Years and $\frac{1}{2}$? *Ans.* 111 l. 11s. 6 $\frac{1}{4}$ d.
3. What is the Interest of 794 l. 16s. 8d. for 7 Years and $\frac{1}{4}$, at 5 per Cent. per Ann? *ans.* 288 l. 2s. 4 $\frac{1}{4}$ d.
4. What is the Interest of 375 l. 5s. for 4 Months, at 5 per Cent. per Ann? *Ans.* 6 l. 5s. 0 $\frac{3}{4}$ d.

SECTION III.

If the Rate per Cent. is $\frac{1}{4}$, $\frac{1}{2}$, or $\frac{3}{4}$ more than the Pound given in the Rate, then multiply by the even Pounds, and for the rest take Parts from the Principal and add to that Product, then work as before.

EXAMPLES.

1. What is the Interest of 450 l. for 4 Years at 3 $\frac{1}{4}$ per Cent. per Ann? *Ans.* 67 l. 10s.

2	450			
	3			
2	1350	l.	s.	d.
	225	16	17	6
	112 10			4
	16 87 10	67	10	0.
	20			
	17, 50			
	12			
	6 00			

3,75
450
18750
1500
16,8750
4
67,5000
20
10 0000

2. What is the Interest of 423*l.* 14*s.* for one Year and $\frac{3}{4}$, at $3\frac{1}{2}$ per Cent. per Ann? *Answ.* 25*l.* 19*s.* 0 $\frac{1}{4}$ *d.* 56
3. What is the Interest of 743*l.* 15*s.* 6*d.* for 5 Years and $\frac{1}{4}$, at $4\frac{1}{4}$ per Cent. per Ann? *Answ.* 165*l.* 19*s.* 1*d.* 15.
4. What is the Interest of 7429*l.* 17*s.* 6*d.* at $5\frac{3}{4}$ per Cent. per Ann. for 7 Years and $\frac{3}{4}$? *Answ.* 3310*l.* 18*s.* 9*d.* 1,3.

SECTION IV.

When the Interest is wanted for any Number of Weeks, make use of the following Proportion.

As 52 Weeks are to the Interest of the given Sum for a Year, so are the given Weeks to the Interest required.

EXAMPLES.

1. What is the Interest of 453*l.* 17*s.* 4*d.* for 3 Weeks, at 5 per Cent. per Ann? *Answ.* 1*l.* 6*s.* 2*d.* 215.
2. What is the Interest of 723*l.* 7*s.* 6*d.* for 24 Weeks, at $4\frac{1}{4}$ per Cent. per Ann? *Answ.* 14*l.* 3*s.* 9*d.*
3. What is the Amount of 378*l.* 16*s.* 7 $\frac{1}{2}$ *d.* for 27 Weeks, at $2\frac{3}{4}$ per Cent. per Ann? *Answ.* 384*l.* 4*s.* 9 $\frac{1}{4}$ *d.*

SECTION V.

When the Interest is required for any Number of Days, the Proportion is thus ;

As 365 Days are to the Interest of the given Sum for a Year, so are the Days given to the Interest required — or thus ;

Bring

Bring the Principal into Pence, and multiply them by the Days and Rate *per Cent.* for a Dividend, cut off two Figures on the Right Hand and divide by 365, the Quotient will be the Interest required.

EXAMPLES.

1. What is the Interest of 112*l.* 10*s.* for 115 Days at 5 *per Cent. per Ann?* *Ans.* 1*l.* 15*s.* 5¼*d.* 37.
2. At 4½ *per cent. per annum*, what is the Interest of 378*l.* 3*s.* 9*d.* for 3 Years and 135 Days? *Ans.* 57*l.* 6*s.* 11¾*d.* 8.
3. What is the Interest of 594*l.* 11*s.* 7*d.* for 9 Years and 52 Days, at 3½ *per cent. per annum?* *Ans.* 176*l.* 13*s.* 4*d.* 17.
4. At 5½ *per cent. per annum*, what is the Interest of 1142*l.* 17*s.* 6*d.* for 6 Years and 197 Days? *Ans.* 429*l.* 15*s.* 2¼*d.* 7.

SECTION VI.

When the Amount, Time and Rate *per cent.* is given, to find the Principal — thus ;

As the Amount of 100*l.* at the Rate and Time given : is to 100*l.* so is the Amount given to the Principal required.

EXAMPLES.

1. What Principal being put to Interest for 3 Years will amount to 515*l.* 4*s.* at 4 *per cent. per annum?* *Answer,* 460*l.*
2. What Principal being placed out at Interest for 10 Years at 3½ *per cent. per annum* will amount to 739*l.* 16*s.*? *Ans.* 548*l.*
3. What Principal being put to Interest will amount to 876*l.* 8*s.* in 8 Years at 5 *per cent. per annum?* *Ans.* 626*l.*

SECTION VII.

When the Principal, Rate *per cent.* and Amount are given, to find the Time—thus ;

As the Interest of the Principal for one Year : is to one Year : : so is the whole Interest to the Time required.

EXAMPLES.

1. In what Time will 460*l.* amount to 515*l.* 4*s.* at 4 *per cent. per annum?* *Ans.* 3 Years.
2. In what Time will 548*l.* amount to 739*l.* 16*s.* at 3½ *per cent. per ann?* *Ans.* 10 Years.
3. In what Time will 626*l.* amount to 876*l.* 8*s.* at 5 *per cent. per ann?* *Ans.* 8 Years.

SECTION VIII.

When the principal Amount and Time are given, to find the Rate *per cent.*—thus ;

As the Principal : is to the Interest for the whole Time : : so is 100*l.* to the Interest for the same Time. Divide the Interest found by the Time, that Quotient will be the Rate *per Cent.*

EXAMPLES.

1. At what Rate of Interest *per cent.* will 460*l.* amount to 515*l.* 4*s.* in 3 Years Time ? *Answ.* 4 *per cent.*

2. At what Rate of Interest *per cent.* will 548*l.* amount to 739*l.* 16*s.* in 10 Years ? *Answ.* 3½ *per cent.*

3. At what Rate of Interest *per cent.* will 626*l.* amount to 876*l.* 8*s.* in 8 Years ? *Answ.* 5 *per cent.*

Note. The Examples in the three last Sections prove each other.

COMPOUND INTEREST,

IS when a Sum of Money is put out upon Interest, and the Interest becoming due, and continued in the Hands of the Debtor becomes Part of the Principal, Interest being reckoned for it from the Time it becomes due ; and is called Interest upon Interest.

Rule. Find the Interest of the Principal for the first Year, which add to that Principal, then work for the Interest of that Sum, which add as before, and so proceed for any Number of Years.

From the last Amount take the given Sum, and the Remainder will be the Compound Interest.

EXAMPLES.

1. What is the Compound Interest of 600*l.* at 3 *per cent.* *per annum.* for 3 Years ? *Answ.* 55*l.* 12*s.* 8½*d.*

				By Decimals.
600				600
3				1,03
18 00				1800
600				6000
618	<i>l.</i>	<i>s.</i>	<i>d.</i>	618,00
3	655	12	8½	1,03
	600			
18 54				1854
618	55	12	8½	6180
336 54				636,54
3				1,03
19 0962				190962
636 54				636540
655 6362				655,6362
20				20
127240				12,724
12				12
86880				8,688
4				4
27520				2,752

2. What is the Amount of 600*l.* forborn 4 Years, at 3 per cent. per annum? *Ans.* 675*l.* 6*s.* 1¼*d.*
3. What is the Amount of 550*l.* at 3½ per cent. per ann. Compound Interest, for 3 Years? *Ans.* 609*l.* 15*s.* 8¼*d.*
4. What will 720*l.* amount to in 4 Years, at 4 per cent. per annum Compound Interest? *Ans.* 842*l.* 5*s.* 11¼*d.*
5. What is the Compound Interest of 480*l.* forborn 7 Years, at 3½ per cent. per annum? *Ans.* 130*l.* 13*s.* 10½*d.*
6. What is the Amount of 523*l.* 10*s.* forborn 9 Years, at 6 per cent. per annum Compound Interest? *Ans.* 883*l.* 8*s.* 10½*d.*
7. What will 489*l.* Compound Interest, amount to in 5 Years at 4 per cent. per annum? *Ans.* 594*l.* 18*s.* 10*s.*

8. What will 200*l.* amount to in 3 Years, the Interest payable half-yearly at 5 *per cent. per annum* Compound Interest? *Ans*w. 231*l.* 18*s.* 9*d.*

REBATE or DISCOUNT,

IS the Difference between a Sum of Money due at any Time to come, and its present Worth.

The present Worth is such a Sum as if put out at Interest would gain in the same Time and at the same Rate for which Discount is allowed.

Rule. As 12 Months : are to the Rate of Interest : : so is the Time mentioned : to a fourth Number ; add that to 100*l.* (then say)

As that Sum : is to the fourth Number : : so is the Sum given : to the Rebate required. From the given Sum take the Rebate, and the Remainder will be the present Worth.

EXAMPLES.

1. What is the present Worth of 520*l.* due 6 Months hence, at 5 *per cent*? *Ans*w. 507*l.* 6*s.* 4 $\frac{1}{4}$ *d.*

2. What is the Rebate of 235*l.* 15*s.* payable in 11 Months, at 5 $\frac{1}{2}$ *per cent*? *Ans*w. 224*l.* 8*s.* 8 $\frac{1}{2}$ *d.*

3. I demand the present Worth of 473*l.* 5*s.* 6*d.* payable 7 Months hence, Discount allowed thereon at 6 $\frac{1}{2}$ *per cent. per annum*? *Ans*w. 455*l.* 19*s.* 8 $\frac{1}{2}$ *d.*

4. What present Money will satisfy a Debt of 85*l.* 10*s.* due at the Expiration of 10 Months, Discount allowed at the Rate of 6 *per cent. per annum*? *Ans*. 81*l.* 8*s.* 7*d.*

5. What ought I to pay for discounting a Note of 16*l.* payable 9 Months hence, bearing Interest at 4 $\frac{1}{4}$ *per cent. per annum*? *Ans*w. 15*l.* 10*s.* 1 $\frac{1}{2}$ *d.*

6. What is present Worth of 340*l.* payable as follows, viz. 200*l.* at 4 Months, and the rest at 8 Months, Discount at 6 *per cent. per annum*? *Ans*w. 330*l.* 13*s.* 10 $\frac{1}{2}$ *d.*

7. Sold Goods upon Trust for 8 Months to the Amount of 95*l.* 10*s.* What is the present Worth at 7 *per cent*? *Ans*w. 91*l.* 4*s.* 10*d.*

9. A young Gentleman had a Legacy of 400*l.* left him by his Uncle, due the 4th of November, but wanting Money, is willing to allow 4 $\frac{1}{2}$ *per cent.* Discount for present pay-

payment, what must he receive, this being the 9th of April? *Ans.* 390*l.*

10. What will be the present Worth of 90*l.* one Half to be paid in 3 Months, the other Half at the End of 9 Months, at 5 per cent. Discount? *Ans.* 97*l.* 16*s.* 4½.

11. Bought Goods to the Amount of 56*l.* 5*s.* to be paid 9 Months hence; what must I pay in present Money Discount at 7½ per cent? *Ans.* 53*l.* 5*s.* 1*d.*

12. What is the present Worth of 500*l.* payable as follows, *viz.* 100*l.* at 3 Months, 150*l.* at 6 Months, and the rest at 12 Months, Discount at 5 per cent? *Ans.* 483*l.* 4*s.* 0¾.

13. How much ready Money must I pay down for a Bond of 248*l.* bearing Date the 19th of May 1764, to be paid on the Christmas Day following, they allowing me 6½ per cent. Discount for present Payment? *Ans.* 230*l.* 19*s.*

EQUATION of PAYMENTS

IS when several Sums of Money to be paid at different Times are reduced to a mean Time for the Payment of the whole, without loss to the Debtor or Creditor; and is commonly found by this Rule.

Multiply each payment by its Time, and divide the Sum of all the Products by the whole Debt, and the Quotient is the equated Time.

EXAMPLES.

1. There is a Debt of 80*l.* to be paid, one Half at 4 Months, the other Half at 6 Months, but if it be reduced to one Payment, at what Time must it be paid? *Ans.* 5 Months.

2. A Tradesman hath owing him 180*l.* to be paid as follows, *viz.* 70*l.* at 4 Months, 80*l.* at 7 Months, and the rest at 9 Months; but his Debtor doth agree to discharge the whole Debt at one equated Time; I demand the Time? *Ans.* 6 Months, 3 Days.

3. A owes B 1000*l.* so that he must pay him 200*l.* in 2 Months, 400*l.* in 8 Months, and the rest in 10 Months; but they agree to reduce the whole to one Payment. In what Time must the whole be paid? *Ans.* 7 Months, 16 Days,

4. R is indebted to T 1200*l.* to be paid in the following Manner, *viz.* 350*l.* at the End of 2 Months, 240*l.*

I

at

at the End of 5 Months, and the Remainder at the Expiration of 8 Months; but if they agree to reduce it to one Payment, at what Time must it be made? *Ans.* 5 Months, 18 Days.

5. A Merchant bought a Quantity of Cloth upon Trust to the amount of 600*l.* to be paid as follows, *viz.* $\frac{1}{2}$ in 4 Months, $\frac{1}{4}$ in 8 Months, and the rest at the End of 12 Months; but they agreed to have but one Payment of the Whole. I demand the equated Time? *Ans.* 7 Months.

BARTER or TRUCK,

IS the exchanging of one Commodity for another, and informs Merchants how to proportion their Quantities, so as neither may sustain Loss.

Rule. First find the Amount of the given Quantity; then find how much of the other Quantity this Amount will purchase at the proposed Rate of Selling of it; or if the Quantity be given, from thence find the Rate of selling it.

Note. When one Commodity is rated above the ready Money Price, calculate what the other Commodity ought to be rated at in Proportion to the Advancement made on the first, and then proceed according to Rule.

EXAMPLES.

1. How much Tea at 9*s.* per *lb.* must be given in Barter for 7 Hhds. of Rum at 9*s.* 4*d.* per Gallon? *Ans.* 49 Cwt.

2. Two Men bartered, A and B, A had 5 Cwt. of Hops at 3*l.* 18*s.* per Cwt. which he would barter with B for Sugar at 1*l.* 12*s.* 4*d.* per Cwt. what Quantity must he have? *Answer,* 12 C. 0*Q.* 7*lb.* nearly.

3. A has 144 Ells of Linen Cloth, worth 15*d.* per Ell, which he would barter with B for Cheese, at 18*s.* 9*d.* per 100*lb.* how many Pounds of it should B give him for the linen? *Answer* 960*lb.* of Cheese.

4. A has Broad Cloths at 10 Guineas the Piece, and B has Mace at 12*s.* per *lb.* how many Pounds of Mace must B give A for 72 Pieces of these Cloths? *Answer* 1260.

5. B has 41 C. 2*qrs.* 14*lb.* of Pepper, at 46*s.* per Cwt. and C has Cotton at 9*d.* per *lb.* how much Cotton must C give B for his Pepper? *Answer* 27 C. $\frac{3}{4}$.

6. A sold B 18 Pieces of Linen at 1*s.* 4*d.* per Yard, and each Piece contained 72 Yards, B gives in Part of Payment

ment 7 Cloths at 9*l.* 8*s.* 6*d.* per Cloth, what remains due ?
Answer 20*l.* 8*s.* 6*d.*

7. A had 14 Cwt. of Sugar at 6*d.* per lb. for which B gave him 1C. 3*qrs.* of Cinnamon, what was it rated at per lb? *Answer* 4*s.*

8. A delivered to B 320 Dozen of Candles, at 4*s.* 6*d.* per Dozen, in Payment whereof B gave him 30*l.* in Money, and the rest in Cotton at 8*d.* per lb. how much Cotton was given ? *Answer* 11C. $\frac{1}{4}$.

9. E bought of F 608 Yards of Broad Cloth at 14*s.* the Yard, in Payment whereof he gave 125*l.* 12*s.* and 85C. 2*qrs.* 25*lb.* of Bees-wax, the Question is to know what the Hundred Weight of the said Wax was rated at ? *Answer* 3*l.* 10*s.*

10. A has 100 Yards of Cloth worth 4*s.* per Yard, but in Barter he values it at 5*s.* per Yard, and will have half paid down in ready Money ; B has Tobacco worth 1*s.* 4*d.* per lb. which he exchanges with A for his Cloth, paying half down in ready Money ; how must B value his Tobacco per lb. so as to be no Loser by A, and how much Tobacco must A have ? *Answer*, B must value his Tobacco at 2*s.* 2*d.* $\frac{2}{3}$ per lb. and must give A 112*lb.* $\frac{1}{2}$.

LOSS and GAIN

DISCOVERS the Gain or Loss of any Commodity, having the Price they cost, and the Price they sold for both given.

EXAMPLES.

1. Bought, a Firkin of Butter containing 56*lb.* for 1*l.* 3*s.* 6*d.* and sold it out at 5 $\frac{1}{2}$ *d.* per lb. what did I gain or lose by the Sale of it. *Answer* 2*s.* 2*d.* gained.

2. Bought, 246 Yards of Cloth for 6*s.* 7 $\frac{1}{2}$ *d.* per Yard, and sold it again for 7*s.* 2 $\frac{1}{4}$ *d.* what is gained by the same ? *Answer* 6*l.* 18*s.* 4 $\frac{1}{2}$ *d.*

3. Bought, 872 Yards of Cloth at 8*s.* 6*d.* per Yard, Sold the same at 10*s.* 4*d.* per Yard, what is gained by the same ? *Answer* 79*l.* 18*s.* 8*d.*

4. A Grocer bought 6C. 3*qrs.* of Cloves at 2*s.* 4*d.* per lb. and sold the same again for 105*l.* 8*s.* what did he gain by the Whole ? *Answer* 17*l.* 4*s.*

5. Bought, 248 Yards of Holland for 62*l.* how must it

be sold *per* Yard to gain 20*l.* 13*s.* 4*d.* by the whole Bargain ? *Answer*, at 6*s.* 8*d.*

6. A Broker bought Goods at 4*s.* *per* *lb.* and sold them again for 3*s.* 4*d.* *per* *lb.* what did he lose *per* Cent. at that Rate ? *Answer* 16*l.* 13*s.* 4*d.*

7. Bought, 365 Yards of Velvet for 337*l.* 12*s.* 6*d.* and sold it again at 19*s.* *per* Yard, what is gained by the Bargain ? *Answer* 9*l.* 2*s.* 6*d.*

8. Bought 40 Quarters of Malt at 25*s.* *per* Quarter, and having received Damage, I lost 12 *per* Cent. by it, what did I lose *per* Bushel ? *Answer* 4½*d.*

9. If in selling Rice at 1*l.* 14*s.* *per* Cwt. I lose 3 *per* Cent. what is the Gain or Loss *per* Cent. when I sell at 1*l.* 16*s.* *per* Cwt. ? *Answer* 2*l.* 15*s.* 2*d.* Gain.

10. If I gave 51*l.* 15*s.* 6*d.* for 1 Cwt. of Cinnamon, at what Rate ought I to sell the same so as to gain 12 *per* Cent. *Answer* 57*l.* 19*s.* 9*d.*

11. An Oilman bought 7 Casks of Oil at 18*l.* 10*s.* *per* Cask ; I demand at what Rate *per* Cask he must sell the same so as to gain 17 *per* Cent. upon the Whole ? *Answer*, 21*l.* 12*s.* 10¾*d.*

12. A Linen-draper bought 79 Pieces of *Irish* Cloth for 117*l.* 12*s.* I desire to know how he must sell them *per* Piece to gain 14*l.* in the laying out of 100*l.* at that Rate ? *Answer*, 1*l.* 13*s.* 11¼*d.*

F E L L O W S H I P,

IS when two or more Men trade together with one common Stock ; and when they have gained or lost, it shews how to find each Man's particular Gain or Loss ; of which there are two Kinds, Single and Compound.

O F S I N G L E F E L L O W S H I P.

Single Fellowship is, when each Partner's Share of the Stock continues for an equal Space of Time.

Rule. As the Sum of all the Stock : is to the whole Gain or Loss :: so is each Man's particular Stock : to his respective Share of the Gain or Loss.

Proof. Add all the Shares together, and the Sum will be equal to the given Gain or Loss.

E X A M P L E S.

1. Two Men, A and B, join in Partnership ; A lays in

24*l.* B 72*l.* and they gain 64*l.* what is each Man's Share of the said Gain? *Answer* A 16*l.* and B 48*l.*

2. Three Persons make a joint Stock, A puts in 750*l.* B 450*l.* and C 300*l.* with this they trade a certain Time, and when they ballance Accounts, find that they have gained 300*l.* What is each Man's Share of the Gain? *Answer*, A's 150*l.* B's 90*l.* C's 60*l.*

3. Suppose three Merchants make a joint Stock, where-with they traded and gained 1890*l.* A put in 1380*l.* B 1890*l.* and C 2400*l.* What is each Man's Share of the said Gain proportionable to his Stock? *Answer* A 460*l.* B 630*l.* C 800*l.*

4. Three Men, A, B and C, sent a Ship to Sea with 324 Tuns of Wine; A 144 Tuns, B 108 Tuns, and C 72 Tuns: now, supposing this Ship to fall among Privateers, who took out of her 135 Tuns of the said Wine, and then let her pass to her Port. How much must each Merchant sustain of the Loss, according to the Rate of his Adventure? *Answer* A 60 Tuns, B 45 Tuns, C 30 Tuns.

5. A Bankrupt's Effects amount to 3300*l.* and he is indebted to A 1500*l.* and to B 2700*l.* How much of the Effects belong to each Person? *Answer* 1178*l.* 11*s.* 5*7*¹/₂. B 2121*l.* 8*s.* 6*6*²/₃*d.*

6. Three Merchants, A, B and C, entered into Partnership; A put in the common Stock 364*l.* B 482*l.* and C 500*l.* By Trade they gained 867*l.* What is each Merchant to have of the said Gain? *Answer* A 234*l.* 9*s.* 3*d.* ³⁵⁴/₁₃₄₆. B 310*l.* 9*s.* 5*d.* ⁶²/₁₃₄₆. C 322*l.* 1*s.* 3*d.* ²³⁹/₁₃₄₆.

7. Four Merchants made a common Stock of 720*l.* A put in 90*l.* B 150*l.* C 180*l.* and D the rest; with this they traded till it was increased to 9000*l.* What did D put into Trade? and how much must each receive at the parting of the Money? *Answer*, D put in 300*l.* and A must receive 1125*l.* B 1875*l.* C 2250*l.* and D 3750*l.*

8. Suppose A, B and C, spend 20*s.* and A agrees to pay $\frac{1}{2}$ of it, B $\frac{1}{3}$, and C $\frac{1}{4}$. What did each pay? *Answer*, A paid 9*s.* 2*4*¹/₂*d.* ¹³/₁₃. B 6*s.* 1*4*⁵/₁₃. C 4*s.* 7*4*⁷/₁₃*d.*

In answering Questions of this Nature, observe, that the $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$ of 20*s.* make 21*s.* 8*d.* or 260*d.* then the Proportion will be, as 260*d.* (the Sum of all the Parts): is to 240, the Pence the Parts should make:: so is each Man's particular Part: to the Money he ought to pay, according to the given Proportion.

9. Suppose a Privateer takes a Prize valued at 27000*l.* and the Agreement was, that the Owners should have $\frac{1}{2}$, the Captain and Officers $\frac{1}{3}$, and the Sailors $\frac{1}{4}$. How much of the Prize belongs to each Party? *Answer.* the Owners must have 12461*l.* $\frac{2}{3}$, the Captain and Officers 8307*l.* $\frac{2}{3}$, and the Sailors 6230*l.* $\frac{1}{3}$. according to the required Proportion.

10. A Gentleman dying, left a Piece of Land, containing 45 A. 3 R. 18 P. to be divided among three of his Tenants, E, F and G, in Proportion to their Rents. Now if E paid 230*l.* per Ann. F 120*l.* and G 86*l.* what is each Tenant's Share? *Answer.* E. 24 A. 0 R. 31 P. F. 12 A. 2 R. 19½ P. and G 9 A. 0 R. 7½ P.

FELLOWSHIP WITH TIME,

Is when each Man's Stock is a particular Time in Partnership.

Rule. Multiply each Man's Stock by the Time it has continued in Trade, and proceed with the Products as with the particular Stocks in the single Rule.

This is as the Sum of all the Stocks, and the Time : is to the whole Gain or Loss :: so is each Person's Stock multiplied into its Time : to the particular Share of his Gain or Loss.

EXAMPLES.

1. Three Merchants traded together, A, B, and C; A put in 340*l.* for four Months, B 672*l.* for six Months, and C 284*l.* for eight Months; and they gained 200*l.* What is each Man's Share of the Gain? *Answer.* A 35*l.* 9*s.* 9½*d.* $\frac{7320}{7684}$, B 105*l.* 4*s.* 4½*d.* $\frac{3360}{7684}$, C 59*l.* 5*s.* 9½*d.* $\frac{4480}{7684}$.

2. A and B made a common stock; A put in 40*l.* for three Months, B 75*l.* for four Months, and they gained 70*l.* What is each Man's Share, proportionable to his Stock and Time? *Answer.* A must have 20*l.* and B. 50.

3. Four Merchants made a joint Stock, A put in 669*l.* for 10 Months, B. 810*l.* for eight Months, C 900 for seven Months, and D 1040*l.* for 12 Months; and their Stocks were increased to 35145*l.* What must each have thereof? *Answer.* A. 7359*l.* B 7128*l.* C 6930*l.* and D 13728*l.*

4. Three Men made a joint Stock as follows: A put in 109*l.* 5*s.* for three Months, B 450*l.* 7*s.* for four Months, and C 147*l.* 12*s.* for six Months; they having gained 209*l.*

7s. 2d. What is each Man's Share of the Gain? *Answer*,
A 22l. 15s. 2d. $\frac{3}{8}$, B 125l. 1s. 11d. $\frac{2}{8}$, C 61l. 10s. 0d. $\frac{2}{8}$.

5. Three Persons, A, B and C, traded together in a joint Stock for twelve Months, at the End of which they gained 80l. A put in at first 50l. and 4 Months after 30l. more. B at first put in 30l. and 6 Months after 40l. more, and 20l. more at the End of 2 Months. C put in at first 70l. 3 Months after 50l. more, and took out 40l. 4 Months after. I desire to know each Person's Share? *Answer*, A 28l. 7s. 1d. B. 17l. 11s. 1d. C 34l. 1s. 10d.

DOUBLE RULE of THREE.

IN this Rule there are always five Numbers or Terms given to find a sixth, *viz.* three contain a Supposition, two a Demand, one of the Terms of Supposition being of the same Name as the Number required, and the other two of the same Kind as the Demanding Terms.

Note. State your Question according to the Directions given in the Single Rule of Three, making your middle Term of the same Name as the Answer of your Question; then take the fourth Number resulting from the first Stating, and place it for the middle Term in your second Stating, and so of your third, &c. Observe well whether your Statings are in the Direct or Reverse Rules, then proceed as those Rules direct.

EXAMPLES.

1. Suppose a Person received 8l. 12s. for the Interest of a certain Sum of Money for 5 Months, after the Rate of 8 per cent. per annum, the Question is, how much Money was lent to raise that Interest? *Answer* 258l.

$\begin{array}{r} \text{l.} \quad \text{l.} \quad \text{l.} \quad \text{s.} \\ \text{As } 8 : 100 :: 8.12 \\ \hline 20 \quad 20 \\ \hline 160. \quad 172. \\ \quad \quad 100 \\ \hline 150 \quad \quad 17200 \quad \quad 0 \end{array}$	$\begin{array}{r} \text{M.} \quad \text{l.} \quad \text{s.} \quad \text{M.} \\ \text{As } 12 : 107 :: 10 \quad 5 \\ \hline 20 \\ \hline 2150 \\ \quad 12 \\ \hline 5 \quad \quad 25800. \\ \hline 2 \quad \quad 0 \quad \quad 516 \quad \quad 0 \\ \hline 258. \end{array}$
---	---

The second Stating is reverse, that is, the less Time will require the more Money.

2. What comes the Interest of 258*l.* to, for five Months, at the Rate of 8*l.* per cent. per annum? *answ.* 8*l.* 12*s.* the Proof of the first Question.

3. If the Carriage of 1*Cwt.* 30 Miles cost 2*s.* what will the Carriage of 10*Cwt.* cost being carried 100 Miles? *answ.* 3*l.* 6*s.* 8*d.*

4. If the Carriage of 10*Cwt.* 100 Miles cost 3*l.* 6*s.* 8*d.* what will the Carriage of 1*Cwt.* cost, being carried 30 Miles? *answ.* 2*s.*

5. If 7 Men in 12 Days reap 84 Acres of Wheat, how many Acres will 20 Men reap in 5 Days? *answ.* 100 Acres.

6. If 100*l.* Principal in 12 Months gain 6*l.* Interest, what will 675*l.* gain in 9 Months? *answ.* 30*l.* 7*s.* 6*d.*

7. A Person received 30*l.* 7*s.* 6*d.* for the Interest of a certain Sum of Money for 9 Months at the Rate of 6 per cent. per annum; how much was out at Interest? *answ.* 675*l.* N. B. 12 Months is a Year.

8. If 38*l.* 8*s.* be the Wages of 32 Men 24 Days, what will be the Wages of 8 Men 3 Days? *answ.* 24*s.*

9. If 20 Horses in 24 Days eat 120 Bushels of Proven-der, how many Bushels will 14 Horses eat in 16 Days? *answ.* 56 Bushels.

10. When Wheat is at 4*s.* 3*d.* per Bushel, the Price of 100*z.* of Bread will be worth 3½*d.* What must be paid for 3*lb.* 6*oz.* when Wheat is at 5*s.* 6*d.* per Bushel? *answer* 2*s.* 5¼*d.* ⅔.

11. If in a Family of 14 Persons there are drank out 48 Gallons of Beer in 8 Days, how many Persons will drink out 36 Gallons in 12 Days? *answ.* 7 Persons.

12. If 300 Pioneers cast a Trench of 200 Rods in 8 Hours, how many Rods of a like Trench will 13600 Pioneers cast in 3 Hours? *answ.* 3400 Rods.

13. If when a Bushel of Wheat cost 10*s.* the Weight of a Loaf worth 9*d.* is 36 Ounces, what ought the Penny Loaf to weigh when Wheat is 3*s.* 4*d.* the Bushel? *answ.* 12 Ounces.

14. A Draper bought 100 Pieces of broad Cloth each 24 Yards at 13*s.* 7*d.* per Yard, what is the Value of 60 Pieces at that Rate? *answ.* 978*l.*

15. I gave 24*l.* 19*s.* 6*d.* for a Hoghead of Wine and sold it so that I lost 6*l.* per cent. what did it go at a Gal-lon? *answ.* 7*s.* 5¼*d.* ⅔.

16. Suppose I can have a Ton of Iron drawn from Deptford to Westminster $4\frac{1}{2}$ Miles distance, for 19s. what must a Piece of Ordnance weigh, that in the same Proportion is drawn from the Warren at Woolwich to the Tower of London, $9\frac{3}{4}$ Miles, for 45s? *answer*, 21C. 3qrs. 12lb. $\frac{1}{2}\frac{1}{4}\frac{1}{7}$.

17. A Grocer bought 2 Chests of Sugar, one weighed 6C. 3qrs. 14lb. at $3\frac{3}{4}d.$ per lb. the other weighed 7C. 1qr. 8lb. at 2l. 1s. 9d. per Cwt. which he would mingle together. I demand how he must sell this Mixture per lb. so as to gain 8l. by the Whole? *answer*, $6\frac{1}{10}d.$

18. Bought, 960 *Flemish* Ells of Dutch Lace, which cost in all 311l. 11s. 6d. for 100 *English* Ells, of which he paid after the Rate of 17s. 7d. per Yard, what did he give per Ell *Flemish* for the Remainder? *answ.* 5s. 1d. $\frac{2}{3}\frac{9}{85}$.

19. Suppose by selling Sugar at 7 Guineas per Cwt. I gained 17l. per cent. what does it stand me in per Pound? *answ.* 1s. 1d. $\frac{3}{11}\frac{3}{2}$.

20. My Factor at Guiney sends me 129lb. of Gold Dust for 1212 Yards of Broad Cloth, which sold at 19s. per Ell *English*, and by so doing I found I cleared 150l. by the Bargain; I demand what the Cloth stood me in per Yard? *Answer*, 12s. $8\frac{1}{2}d.$ $\frac{3}{4}$.

21. A Person in Trust for the Poor has 400l. 10s. to distribute among 25 poor Men, at $7\frac{1}{2}d.$ each per Day, and 50 poor Women at $5\frac{1}{4}d.$ each, 60 poor Children at $3\frac{1}{2}d.$ each; how long will this Sum relieve them? *Answer* 145 Days.

22. A Grocer bought 1Cwt. of Tea at 10s. 9d. per lb. but it not answering in Goodness, was willing to lose 3 Guineas by the Whole; what must he sell it at per oz? *Ans.* $7\frac{1}{2}d.$ $\frac{9}{16}$.

23. A General had 3752l. 11s. 6d. to maintain a certain Number of Soldiers for 3 Years, 5 Months, 20 Days, allowing each Man 7d. per Day; how many Men will this Sum maintain? *Ans.* 102 Men.

24. Suppose a Piece of Ordnance spends $15\frac{1}{2}lb.$ of Powder at a Charge, how many Pounds will discharge her 98 Times, and what comes it to at $9\frac{3}{4}d.$ per lb? *Answer* 61l. 14s. $2\frac{1}{4}d.$ and 1519lb. of Powder.

25. How much Tea at 56l. per Cwt. shall I have in lieu for 5C. 3qrs. 17lb. of Silk at 16s. 9d. per lb? *Answer* 5C. 3qrs. 58lb. $\frac{7}{16}$.

26. A Butcher bought an Ox that weighed 99 Stone, besides Skin and Offal, for 11*l.* 12*s.* there were 8½ Stone of Suet that he sold at 4½*d* per *lb.* the Skin and Offal he sold for 1*l.* 3*s.* 9*d.* how much might this Beef stand him in per Stone? *Answer.* 2*s.* 0*d.* $\frac{1}{8}\frac{1}{2}$.

27. A Cornfactor bought Corn to the Amount of 76*l.* 10*s.* there were 30 Quarters of Wheat at 19*s.* per Quarter, and for every 5 Quarters of Wheat he bought 9 of Barley; what Quantity had he of Barley, and what did it cost him per Bushel? *answer,* 54 Quarters, at 2*s.* 2½*d.* $\frac{2}{3}$ per Bushel.

28. A Gentleman lying on his Death-Bed bequeathed to his Nephew a Guinea and a Noble per Day for his Expences, but the young Man saved 9*s.* 4*d.* per Day out of it, and by that Time he had saved enough to buy an Estate worth 3000*l.* he died; I desire to know what Money he had spent in that Time, and how long he had been on his Expences? *Answer,* spent 5892*l.* 6*s.* 8*d.* in 17 Years, and 223 Days.

29. A Grocer sold Tea at 6*s.* per *lb.* he likewise sold Prunes at 2*l.* and a Noble per Chest; I desire to know how many Pounds of Tea are equal to 70 Chests of Prunes? *answer,* 544*lb.* $\frac{4}{9}$.

30. A Grazier bought 5 Score of Sheep for 15*s.* per Head, and sold them afterwards for 1*l.* 1*s.* a Head; what did he gain per cent. admitting the Charges of keeping to be 9*l.* 18*s.* 7*d.*? *answer,* 26*l.* 15*s.* 2½*d.* $\frac{2}{3}$.

31. My Correspondent advises me he hath made 247*l.* 11*s.* 6*d.* of 98 Pieces of Irish Cloth, each 27 Yards; paid Packing and Portorage 2*s.* 6*d.* per Piece, Custom 5*d.* per Yard, Freight 2*l.* 11*s.* 9*d.* he in Return sends me 12 Hogheads of Rum, at 18*l.* per Hogshead, the Charges of Freight, Custom, and other Duties, amounting to 97*l.* 15*s.* 6*d.* I desire to know how this Article of Trade stood as to Profit and Loss when brought to a Ballance? *answer,* 3*l.* 15*s.* 3*d.* loss.

32. Suppose a Captain hath 582*l.* 10*s.* to maintain 500 Men for 9½ Months, what must each Man have per Day, deducting 15*l.* 18*s.* 9*d.* per cent. for the Payment of Officers and other Charges? *answer.* 8½*d.* $\frac{1}{2}\frac{1}{6}\frac{1}{10}$.

33. A Merchant bought 4 Oxen to victual his Ship, which weighed, besides Skin and Legs, 402*lb.* and cost him 89*l.* 18*s.* 10*d.* and in them were 49½ Stone of Suet which

which he sold for $3\frac{1}{2}d.$ per lb. the Skins and Legs sold for $3l. 18s. 10d.$ what did 1 Pound of Beef cost him? *answer* $5\frac{1}{4}d. \frac{82}{362}.$

34. A Merchant consigned 4376 Yards of broad Cloth to his Correspondent at *Jamaica* with orders to sell it at $1l. 9s. 6d.$ per Yard, and to return the $\frac{1}{4}$ in Sugar at $1l. 18s. 9d.$ per Cwt. the $\frac{1}{8}$ in Pepper at $7l. 1s. 6d.$ per Cwt. and the rest in Rum at $7s. 9d.$ per Gallon; what Quantity of each ought the Merchant to receive?

Answer { Sugar 832C. 3qrs. 8lb.
Pepper 112C. 2qrs. 14lb.
Rum 82 Pipes 1Hbd. $15\frac{1}{2}$ Gall.

35. A Merchant at *London* shipped to his Factor at *Jamaica* 300 Dozen pair of Shoes at $5s. 7d.$ per Pair, 200 Pair of Stockings at $3s. 9d.$ per Pair, 400 Yards of broad Cloth at $1l. 6s.$ per Ell *English*; to have return from thence $\frac{1}{8}$ in Ginger at $12d.$ per lb. $\frac{1}{4}$ in Pepper at $1s. 6d.$ per lb. $\frac{1}{8}$ in Tobacco at $2s.$ per lb. and the rest in Rum at $29l. 19s.$ per Pipe, what Quantity of each must he have?

Answer { Of Ginger 32C. 2qrs. $6\frac{1}{4}lb.$
Of Pepper 43C. 1qr. $17\frac{2}{3}lb.$
Of Tobacco 21C. 2qrs. $22\frac{5}{8}lb.$
In Rum 22 Pipes 42 Gall. $\frac{359}{1198}.$

36. A Gentleman being minded to buy an Estate of 1200l. per annum at 21 Years purchase, but is informed by a Friend that there are two Incumbrances upon it, viz. first the Estate is charged with an Annuity of 150l. a Year to a Gentlewoman of 45 Years of Age, whose Life may be reckoned at $13\frac{1}{2}$ Years purchase. Secondly, 3l. a Month to a Minor of 12 Years of Age, whose Life may be deemed at $29\frac{1}{2}$ Years purchase: Now suppose the Attorney at Law to have 50 Guineas to secure the Title of the Estate, the Register Office and other Fees amounting to $7l. 12s. 9d.$ What Money must the Gentleman draw for to compleat the Purchase? *Answer* 28347l. 2s. 9d.

37. What is the Value of 13 Pieces of Linen, the Contents and Prices as follow, viz. 4 Pieces containing 59, 60, 58 and $60\frac{1}{2}$ Ells at $2s. 2d.$ per Ell; 3 Pieces, 60, 56 and 57 Ells at $2s. 6d.$ per Ell; 4 Pieces 59, 60, 56 and 60 Ells at $3s.$ per Ell; and 2 Pieces of 60 and 61 Ells at $3s. 4d.$ the Ell? *answer* 102l. 15s. 5d.

38. A Draper laid out 350l. the $\frac{1}{3}$ in Irish Cloth at $1l. 12s.$ per Piece, the $\frac{1}{3}$ in *Holland* at $2l. 12s.$ per Piece, and the rest
in

in flowered Linen at 20*d.* *per* Ell *English*: I demand how much he had of each Sort?

Answer { $72\frac{1}{2}$ Pieces of *Irish* Cloth.
 $44\frac{3}{4}$ Pieces of *Holland*.
 1400 Ells of flowered Linen.

39. A Merchant sold 4 Pieces of Silk, containing 67, $24\frac{1}{4}$, $32\frac{1}{3}$, and $27\frac{1}{2}$ Yards at 19*s.* 6*d.* *per* Yard, and received 3 Parcels of Tea, weighing as follow: $42\frac{1}{3}$, $28\frac{1}{2}$, and $48\frac{1}{6}$ Pounds at 11*s.* 8*d.* *per* lb. and 36 Moidores: What remains due? *answ.* 29*l.* 0*s.* $1\frac{1}{2}$ *d.*

40. A Merchant sent Goods to *France* to the Value of 3219*l.* 15*s.* upon the Sale of which he gained 31*l.* 14*s.* 9*d.* *per* Cent. which Principal and Gains were returned in Commodities, upon the Sale of which he lost 12*l.* 11*s.* 8*d.* *per* Cent. What was the Merchant's neat Gain? *answer* 488*l.* 2*s.* 8*d.*

E X C H A N G E.

EXCHANGE is the drawing or receiving the Money, Weight or Measure of one Country, for the like Value of another, by means of a Writing or Instrument, called a Bill of-Exchange.

S E C T I O N I.

Of the Computation of Exchange between *England* and *Holland*, according to the *London* Course.

The *Hollanders* keep their Accounts in Guilders, Stivers and Pennings.

Note, 8 Pennings	make	1 Groot, also
16 Pennings	—	1 Stiver
20 Stivers	—	1 Guilder
6 Stivers or 12 Groots	—	1 Schelling
20 Schellings or 6 Guilders	—	1 Pound <i>Flemish</i> .

There are in *Holland* two Sorts of Money, Current and Bank, all Bills of Exchange are paid in the latter.

The Difference between them are from 3 to 6 *per* Cent. according to the State of Commerce, and Money Transaction relating thereto, and this Difference is called the Agio.

When a Bank Note is received in Cash, the Agio is added to it, but when Cash is paid into the Bank for a Note, it is subtracted, consequently Bank Money is made current by

by the Interest, but current Money is made Bank by discount.

To reduce the Current into Bank Money, admitting the Agio $4\frac{1}{2}$ per cent..

E X A M P L E S.

1. If $104\frac{1}{2}$ Guilders Current give 100*l.* Bank, what will $2765\frac{1}{2}$ Guilders give? *Ans.* 2646 Guild. 8 Stiv. 3 Penn.

To reduce Bank Money into Current.

2. If 100 Guilders Bank give $4\frac{1}{2}$ advance Current, what will 2646 Guild. 8 Stiv. 3 Penn. give? *Ans.* the whole Advance is 119 Guild. 1 Stiv. 12 Penn. which added to the Bank Money of 2646 Guild. 8 Stiv. 3 Penn. makes Current Money $2765\frac{1}{2}$ Guild. This Question is a Proof to the foregoing.

To change *Flemish* Money into Sterling.

Rule. As the given Rate : is to 1 Pound :: so is the *Flemish* Sum given : to the Sterling required.

To change Sterling Money into *Flemish*.

Rule. As 1*l.* Sterling : is to the given Rate :: so is the given Sterling : to the *Flemish* required.

1. Reduce 774*l.* 10 *sch.* Bank Money of *Amsterdam* into Sterling Money of *England*, exchange at $34\frac{1}{2}$ Schellings *Flemish* per Pound sterling. *Facit* 4487*l.* 16*s.* $6\frac{1}{4}$ *d.*

2. Reduce 987*l.* 18*s.* 10*d.* sterling into *Dutch* Money Exchange at 35 Schellings *Flemish* per Pound sterling? *Facit* 1728*l.* 17 *sch.* 5 *sti.* 11 *p.*

3. *London* draws on *Amsterdam* for 273*l.* 17*s.* 3*d.* sterling. how many Guilders paid the Bill Exchange at 6*s.* 4*d.* per Guilder? *Ans.* 864 guil. 16 *sti.* 9 *p.*

4. *Amsterdam* draws on *London* for 3716 Guilders, how much sterling pays the Bill Exchange at $35\frac{1}{2}$ Schellings *Flemish* per Pound sterling? *Ans.* 348*l.* 18*s.* 5*d.*

5. *London* draws on *Antwerp* for 24*l.* 9*s.* sterling; how much *Flemish* Money pays the Bill Exchange at 35 Schellings and 10 Pennings per Pound sterling? *Ans.* 430*l.* 1 *sch.* 3 *sti.* 15 *p.*

6. *Antwerp* draws on *London* for 476*l.* 10 *sch.* $8\frac{1}{2}$ groots *Flemish*; how much sterling pays the Bill Exchange at 34 *sch.* 1 *sti.* 6 *p.*? *Ans.* 279*l.* 14*s.* $11\frac{1}{4}$ *d.*

S E C T I O N II.

London Exchanges on *Hamburg* as on *Holland* from 32 to about 35 Schellings and Groots *Flemish* per Pound sterling.

At *Hamburg* they keep their Books of Account in Marks, Schellings, and Pennings Lubs, and by some in Rix-Dollars, Schellings, and Pennings; and by others, in Pounds, Schellings, and Pennings *Flemish*, the one being convertible into the other.

Note, 12 Pennings, or 2 Groots make 1 Schelling Lubs

6 Schellings Lubs	—	1 Schelling <i>Flemish</i>
16 Schellings Lubs	—	1 Mark
3 Marks or 48 Schellings Lubs		1 Rix-Dollar
7½ Marks or 2½ Rix-Dollar		1 Pound <i>Flemish</i>
8 Schellings <i>Flemish</i>	—	1 Rix-Dollar
120 Schellings Lubs	—	1 Pound <i>Flemish</i>

EXAMPLES.

1. *London* draws upon *Hamburg* for 620*l.* sterling Exchange at 34*sch.* *Flemish* per Pound sterling; how many *Hamburg* Marks pays the Bill? *Ans.* 79030 mks.

2. *Hamburg* draws upon *London* for 2058 mks. 10*sch.* 6 penn. lubs Exchange at 33*sch.* 10 groots *Flemish* per Pound sterling; what must be paid for this Draught in *English* Money? *Ans.* 161*l.* 8*s.* 9*d.*

3. How many Rix-Dollars may I have for 1817*l.* 12*s.* 6*d.* sterling Exchange at 34½*sch.* *Flemish* per Pound sterling? *Ans.* 7838 rix-d. 4*sch.* 0 gr. 4½*p.*

4. What sterling Money must be drawn for Wares bought in *Hamburg* amounting to 4786 Rix-Dollars, Exchange at 33¼*sch.* *Flemish* per Pound sterling? *Ans.* 1151*l.* 10*s.* 4½*d.*

SECTION III.

England exchanges on *Franckfort* for Florins.

EXAMPLES.

1. How many Florins at 60½*d.* each can I have for 700*l.* 11*s.* 6*d.* sterling? *Ans.* 2779½ Florins.

2. *Franckfort* draws on *London* for 7000 Florins at 49¼*d.* each; how much sterling pays the Bill? *Ans.* 1451*l.* 0*s.* 10*d.*

SECTION IV.

London exchanges with *France* on the French Crown of 3 Livres Tournois, or 60 Sols French, and gives Pence sterling more or less for the said Exchange Crown of 3 Livres Tournois of *France*.

Accompts are kept in *France* in Livres, Sols, and Deniers.

Note,

Note. 12 Deniers make 1 Sol

20 Sols ——— 1 Livre

3 Livres ——— 1 Crown.

EXAMPLES.

1. At $31\frac{1}{2}d.$ per Crown, how many must be paid for 2294*l.* 5*s.* sterling? *Answ.* 17480 Crowns.

2. A Bill for 12559 Livres, 2 Sols, 3 Deniers, is remitted to *London*; what does it amount to at $31\frac{1}{2}d.$ sterling per Crown? *Answ.* 549*l.* 9*s.* $2\frac{1}{2}d.$

3. *London* draws on *Paris* for 7621*l.* 16*s.* 7*d.* how many Livres pays the Bill, at $33\frac{1}{4}d.$ sterling per Crown? *Answ.* 165044 *liv.*

4. A Bill is drawn from *Paris* of 1761 Crowns, 1 Livre, and 19 Sols, at 2*s.* 10*d.* per Crown; how much *English* Money pays the Bill? *Answ.* 249*l.* 11*s.* 4*d.* $\frac{1}{8}$.

5. Bought Wares for a Merchant of *Bordeaux*, amounting to 102*l.* 4*s.* sterling, for which he ordered a Bill to be drawn on him? how many *French* Crowns do these Wares amount to, Exchange at 53*d.* per Crown? *Answ.* 462 *cro.* 2 *liv.* 7 *sol.*

SECTION V.

London exchanges with *Spain* on the Dollar and Piastre of *Spain* for so many Pence sterling, according to the Price of Exchange.

In *Madrid*, *Cadiz*, and *Malaga*, and all the *Spanish* Places of Trade, in the *Streights*, *Mediterranean*, *Africa*, and the *West Indies*, the *Spaniards* keep their Accompts chiefly in Dollars, Rials, and Marvedies.

Note. 34 Marvedies make 1 Rial.

8 Rials ——— 1 Piastre, or Piece of Eight

10 Rials ——— 1 Dollar

EXAMPLES.

1. *London* draws on *Madrid* for 714*l.* 17*s.* 6*d.* How many Dollars pays the Bill Exchange at $59\frac{3}{4}d.$ sterling? *Answ.* 2868 *dol.* 1 *rial*, 5 *mar.*

2. A Factor hath sold Goods at *Cadiz* for 1768 Dollars, 7 Rials at $58d.\frac{7}{8}$ sterling per Dollar; how much Sterling is the Sum? *Answ.* 433*l.* 17*s.* 8*d.* $\frac{1}{8}$.

3. My Agent at *Seville* advises me, that he hath sold Goods for 7000 Pieces of Eight, at 54*d.* each; how much Sterling must I draw for? *Answ.* 1575*l.*

SECTION VI.

London exchanges on *Genoa* and *Leghorn* for Dollars or Pieces of Eight, and gives Pence sterling, more or less, for the said Dollar or Piece of Eight.

They keep their Accompts in Livres, Sols, and Deniers.

Note. 12 Deniers make 1 Sol
 20 Sols — 1 Livre
 5 Livres — 1 Piece of Eight at *Genoa*
 6 Livres — 1 Piece of Eight at *Leghorn*.

EXAMPLES.

1. *Leghorn* draws on *London* for 876 Dollars; how much Sterling pays the Bill Exchange at 54*d.* per Dollar? *Ans.* 197*l.* 2*s.*

2. *London* draws on *Leghorn* for 140*l.* sterling in Pieces of Eight Exchange, at 54*d.* per Piece; how many pays the Bill? *Ans.* 622 *piec.* 1 *liv.* 6 *so.* 8 *den.*

3. If I pay a Bill at *London* of 483*l.* 12*s.* sterling; how many Pieces of Eight may I draw my Bill for at *Genoa*, Exchange at 54*d.* $\frac{1}{2}$ each? *Ans.* 2129 *piec.* 3 *liv.* 1 *sol.* 5 *den.*

4. A Factor hath sold Goods at *Genoa* for 438 Dollars, at 53*d.* each; what is the Value in sterling Money? *Ans.* 96*l.* 14*s.* 6*d.*

SECTION VII.

London exchanges on *Venice* upon the Ducat of 24 Grains for more or less Pence sterling. They keep their Accounts in Livres, Sols, and Deniers current, and reckon by 12 and by 20, and the Livre at 10 Ducats Bank or 12 Ducats Current.

Note. 6 Solidi make 1 Gros
 24 Gros — 1 Ducat

EXAMPLES.

1. A Bill of 1100 Ducats is remitted to *London* at 4*s.* 4*d.* per Ducat; how much Sterling pays the Bill? *Answer,* 238*l.* 6*s.* 8*d.*

2. *London* draws on *Venice* for 179*l.* 11*s.* Sterling; how many Ducats at 4*s.* 2*d.* each will pay the Draught? *Ans.* 861 *duc.* 20 *gros.* $\frac{4}{5}$.

SECTION VIII.

London exchanges on *Florence* for Ducatoons, and gives Pence more or less sterling for the same.

EXAMPLES.

1. How much sterling Money can I have for 200 Ducatoons Exchange, at 50*d.* each? *Ans.* 4*l.* 13*s.* 4*d.*

2. How many Ducatoons, at 4*s.* 6*d.* each, can I have for 100*l.* 11*s.* 6½*d.* Sterling? *Ans.* 4451 *duc.* $\frac{49}{108}$.

SECTION IX.

London exchanges with Portugal in the Milrea, and gives Pence sterling more or less for the same.

In all Parts of this Kingdom they keep their Accompts in Milreas and Rees, reckoning 1000 Rees to a Milrea; they separate the Milrea thus, 488 $\cup$ 429, which signifies 488 Milreas and 429 Rees.

EXAMPLES.

1. What is the sterling Value of 2000 Milreas, at 6*s.* 8*d.* each? *Ans.* 666*l.* 13*s.* 4*d.*

2. Change 486*l.* 13*s.* 6*d.* sterling into Milreas, Exchange at 6*s.* 8*d.* per Milrea? *Facit.* 1460 *mil.* 025 *reas.*

3. A Factor at Oporto remits to his Employer at London 5432 Milreas and 346 Rees, Exchange at 6*s.* 7½*d.* per Milrea; how much Sterling is the Sum? *Ans.* 1802 *l.* 5*s.* 10½*d.*

London draws on Lisbon for 846*l.* 14*s.* 6*d.* sterling; how many Milreas, at 6*s.* 6¾*d.* each, pays the Bill? *Answer.* 2592 *mil.* 842 *reas.*

SECTION X.

Of the Exchange between England and Ireland.

The Exchange is from 105*l.* to 112*l.* Irish Money, for 100*l.* sterling.

EXAMPLES.

1. How much sterling Money can I receive in London for 488*l.* 11*s.* Irish, Exchange at 9 per cent? *Ans.* 448*l.* 4*s.* 2½*d.*

2. What must a Person draw for at Ireland if he pays at London 596*l.* 15*s.* sterling, Exchange at 12 per cent? *Ans.* 668*l.* 7*s.* 2¼*d.*

SECTION XI.

Of the Exchange between England and Jamaica.

The Exchange between England and Jamaica is one hundred Pounds sterling for one hundred and forty Pounds Jamaica Currency.

The Money of *Jamaica* is both real and imaginary, or nominal, called Currency.

The inaginary or nominal Money is denominated by Pounds, Shillings, Pence and Farthings, as in *England*; and all Accompts are kept and Computations made in that Manner.

The real Money or Species is *Spanish* Pistoles, in Gold; and *Spanish* Dollars, Pistareens, and Ryals, in Silver.

The *Spanish* Pistole goes for 23s. 9d. the Dollar for 6s. 3d. the Pistareen for 1s. 3d. and the Ryal for 7½d. Currency.

E X A M P L E S.

1. Suppose a Factor at *Jamaica* sends Advice to his Employer in *England* to make Insurance on a Cargo of Sugar shipped by him for *England*, the Value, by the *Jamaica* Invoice, amounting to 10768l. 3s. for how much Money sterling must the Voyage to *Jamaica* be credited for the Return? *Ans.* 7691l. 10s. 8½d.

2. A Planter in *Jamaica* purchased an Estate, Negroes, &c. for 47698l. Currency, and paid for the same in Bills of Exchange on *London*; how much sterling Money did the Bills amount? *Ans.* 34070l.

3. If a Merchant in *London* draws on his Factor in *Jamaica* for 4716l. 11s. sterling Value; how much must his Bill be for in *Jamaica* Currency? *Ans.* 6603l. 3s. 4¾d.

4. A Factor has a Quantity of Goods to dispose of at *Jamaica*, amounting to 7141l. 18s. sterling, and has an Opportunity to sell the whole together at 50 per cent. advance on the sterling Invoice; what will the whole amount to in *Jamaica* Currency, according to such Agreement? *Ans.* 10712l. 17s.

S E C T I O N XII.

The present *Pars* of Exchange with several Provinces.

<i>Virginia</i>	_____	125	<i>Boston</i> in <i>New England</i>	135½
<i>Barbadoes</i>	_____	135	<i>New-York</i> and <i>East Jer-</i>	
<i>Maryland</i>	_____	145	<i>sey</i>	171¾
<i>North Carolina</i>	—	145	<i>Pensilvania</i> and <i>West Jer-</i>	
<i>South Carolina</i>	—	700	<i>sey.</i>	160½
<i>Antigua</i> and <i>St. Chris.</i>		165		

E X A M P L E S.

1. My Agent at *St. Christopher's* desires me to remit him 3000l. sterling; how much Currency is he accountable for? *Ans.* 4950l.

2. A Planter in *York Town, Virginia*, consigned to his Factor in *London* a Cargo of Tobacco, the Value of which amounting, as *per Invoice*, to 1317*l.* 12*s.* Currency; how much Sterling will he be creditor for in *London*? *Ans.* 1054*l.* 1*s.* 7½*d.*

3. Remitted from *London* to *South Carolina* a Bill of 525*l.* 10*s.* sterling; how many Pounds nominal, Plantation Currency is the Sum? *Ans.* 3678*l.* 10*s.*

4. How many Pounds of *New York* Currency are equal to 1400*l.* Sterling? *Ans.* 2400*l.*

5. If I pay a Bill at *Pennsylvania* of 1450*l.* that Province's Money, for how much sterling may I draw my Bill for at *London*? *Answer.* 902*l.* 4*s.* 5¼*d.*

6. My Correspondent at *Boston* in *New England*, writes me Notice, that he has shipped me on board a Cargo amounting, as *per Invoice*, to 3869*l.* 15*s.* 6*d.* lawful Money of *Boston*; how much sterling Money must I make Insurance to cover the Risque of the said Adventure? *Ans.* 2882*l.* 5*s.* 5¾*d.*

BILLS OF EXCHANGE.

A Factor's Remittance to his Employer.

Venice, August 10, 1764, for 575 Ducats,
at 56½*d.* Usance.

AT Usance pay this my first of Exchange to Sir *Bar-naby Bright* or Order, five hundred and seventy-five Ducats at fifty-sixpence halfpenny sterling *per Ducat* value on ourselves, and place it, *per Advice*, to the Accompt of To Mr. *William French*, Mercht. *Sebastian and Hall.*
Tower-hill, London.

How much sterling does the above Bill amount to?
Answer, 135*l.* 7*s.* 3½*d.*

Leghorn, Nov. 14, 1764.

per 700 Pcs. of ⅘ Mex. at 3 Months.

Three Months after Date, pay this my first of Exchange to *Robert Wood*, Esq; or Order, seven hundred Pieces of ⅘ at fifty-four Pence sterling *per Piece*, for the Value received of himself, and place it to Accompt, as *per Advice* from *William Christmas and Co.*

To Messrs. *Whicbell and French*,
Bankers, *Minories, London.*

How much Sterling pays the above Bill? *Ans.* 157*l.* 10*s.*

Lisbon, March 1, per 2110 197, Exchange
at 6s. 3 $\frac{1}{4}$ d. per 100.

At Usance pay this my first of Exchange to Don *Diego Babanetto*, or Order, the Sum of two hundred and eleven Milreas and one hundred and ninety seven Rees, at sixty three Pence three Farthings per Milrea, Value in Accompt, and place it to Messrs. *Bojalo, Onfoli, and Camora*, of *Nismes*, as per Advice from them.

Joseph Aldermoni.

To *Edward Wall*, Mercht.

Little Moorgate, London.

How much Sterling pays the above Bill? *Ans. 56l. 1s. 11 $\frac{3}{4}$ d.*

Paris, July 19, 1763, per Crowns 1100,
at 32d. per Crown.

At double Usance pay this my only Bill of Exchange to yourself, the Sum of eleven hundred Crowns, Exchange at thirty-two Pence sterling per Crown, the Value received of *Monf. Duverneuil*, and place it, as per Advice, to the Accompt of

Alex. Davids.

To *Jonathan Bonafou*,

Mercht. at *Liverpool*.

What is the Amount of the above Bill in *English Money*?

Ans. 146l. 13s. 4d.

Foreign Bills are most commonly at Usance, that is a certain Time from the Date of the Bill, to the Time it comes due, which is different according to the Distance, viz. between *London* and *Amsterdam, Paris, Hamburg, &c.* in one Month; between *London* and all Places in *Spain* and *Portugal*, two Months; between *London* and *Leghorn, Genoa, Venice, &c.* in three Months.

COMPARISON OF WEIGHTS and MEASURES.

EXAMPLES.

1. IF 25lb. at *London* make 20lb. at *Hamburg*, how many lb. at *London* will be equal to 240lb. at *Hamburg*?

Ans. 300lb.

2. If 9 Ells at *Antwerp* make 14 Ells at *London*, how many Ells at *Antwerp* will be equal to 336 Ells at *London*?

Ans. 216 Ells.

CONJOINED PROPORTION,

Is the comparing of Coin, Weights and Measures of several Countries; or it is linking them together in a Variety

riety of Proportions, which may be solved by the Double Rule of Three,

E X A M P L E S.

1. If 140lb. at *Leghorn* are equal to 160lb. at *Naples*, and 40lb. at *Naples* are equal to 30lb. at *London*, how many Pounds at *Leghorn* are equal to 270lb. at *London*? *Ans.* 315lb.

2. If 200lb. *English* make 190lb. *Flemish*, and 38lb. *Flemish* 50lb. at *Belonia*, how many Pounds *English* are equal to 100l. at *Belonia*? *Ans.* 80lb. *English*.

3. If 80lb. *English* make 100lb. at *Belonia*, and 50l. at *Belonia* make 38lb. *Flemish*, how many Pounds *English* make 190lb. *Flemish*? *Answer,* 200lb. *English*.

ARITHMETICAL PROGRESSION,

IS when a Rank of Numbers above two increase or decrease by the continual Addition or Subtraction of one and the same Number, as 3, 5, 7, 9, 11, 13, 15, and 17, 14, 11, 8, 5, 2, are two Ranks of Numbers in Arithmetical Progression; the first increasing by the continual Addition of 2, and the other decreasing by the continual Subtraction of 3, and so of any other. In this Progression five Things are to be diligently required, *viz.* 1st. the first Term. 2d. The last Term. 3d. The Number of Terms. 4th. The common Difference, and 5thly, the Sum of all the Terms. Any three of these being given, the others may be found, and the Number of Varieties are Twenty. To find the last Term.

Rule, Multiply the common Difference by a Number less by one than the Number of Terms, and to the Product add the first Term, the Sum will be the last Term.

To find the Sum of the whole PROGRESSION.

Rule, Add the first Term to the last Term, and multiply that Sum by half the Number of Terms, this Product will be the Sum of the whole Progression.

E X A M P L E S.

1. A *Grazier* bought 100 Sheep, and agreed to pay for the first Sheep 1s. for the second 4s. so increase the Price of every Sheep by 3s. I demand what the Sheep cost him? *Answer* 747l. 10s.

106 *Arithmetical Progression.* ACCOMPTANT'S

2. Suppose a Person bought 80 Bales of Cloth, and agreed to give for the first Bale 6*l.* for the second 8*l.* and for the third 10*l.* so encreasing the Price of each Bale by 2*l.* what did he pay for the last Bale, and what did the whole cost? *Answer*, he gave for the last Bale 164*l.* and the whole cost 6800*l.*

3. If 100 Stones are placed in a right Line a Yard distant from one another, and the first a Yard from the Basket, how far must one go to bring the Stones one by one into the Basket, and what would be the Difference of the Journey betwixt him and another that was to bring in 200 Stones placed as above, and in the same Manner? *Answer* the first goes 10100 Yards, and the second 40200, so that the last goes 30100 Yards more than the first, or 17 Miles 180 Yards.

To find the NUMBER of TERMS.

Rule, If twice the Sum of the whole Progression be divided by the Sum of the first and last Terms the Quotient will be the Number of Terms.

To find the COMMON DIFFERENCE.

Rule, Subtract the least Term from the greatest, and divide the Remainder by a Number less by one than the Number of Terms, and the Quotient will be the common Difference.

4. A Gentleman being indebted to several Creditors 6480*l.* ordered his Steward to discharge them at several Payments, the first Payment to be 40*l.* and the last 500*l.* I desire to know the Number of Creditors and Difference between each? *Answer* 24 Creditors, and Difference 20*l.*

5. A Gentleman has an Estate of 1317*l.* 10*s.* per Annum, which is left to a Number of Tenants, whose Rents are in Arithmetical Progression, but the Number of Tenants he had forgot, and only knows that the greatest Tenant paid 91*l.* 8*s.* per Annum, and his least but 14*l.* per Annum; how many Tenants had he, and what was the common Difference betwixt every two next? *Answer* 25 Tenants, and the Difference 3*l.* 4*s.* 6*d.*

GEOMETRICAL PROGRESSION,

IS when the Numbers increase or decrease by one common Multiplier or Divisor, thus :

3, 9, 27, 81, 243, 729, increased by the common Multiplier three.

128, 32, 8, 2, decreased by the common Divisor four.

There are two Ranks or Series of Numbers in Geometrical Proportion, that is, the first contains, or is contained in the second, as many Times as the second contains or is contained in the third, &c.

In this Progression the same things are to be considered as in Arithmetical Progression, as the first Term, the last Term, the Number of Terms, the Ratio or common Difference, or excess, and the Sum of all the Terms.

If over a Series of Terms in Geometrical Progression be set a Series of Terms in Arithmetical Progression, they are called Indices,

Thus 0, 1, 2, 3, 4, 5, Indices,
4, 8, 16, 32, 64, 128, Terms.

These Indices or Expoments, beginning with a Cypher and placed over any Series in Geometrical Progression, shew the Distance of any Term from the first.

Rule 1st. In any Geometrical Progression, if you add the Indices of any 2 Terms, and multiply the Terms together, and divide the Product by the first Term, the Quotient will be the Term answering the Sum of Indices you add.

Rule 2d. If the last Term be multiplied by the Ratio, and from the Product subtract the first Term, and divide the Remains by one less than the Ratio, the Quotient will be the Sum of the whole Progression.

EXAMPLES.

1. An honest Country Farmer brought a String of 20 fine Horses to *Smithfield*, which a Dealer observing, demanded the Price of each, and was answered 46*l.* at which he undervalues them, and said, there was one amongst them not worth a Farthing; well says the Countryman you shall have him for a Farthing, if you will give me 3 Farthings for the next, and 9 for the next, and 27 for the next, and so on to the 20th, and last Horse, take the whole Number; done says the Jockey, and there is a Bank-Note of a hundred Pounds to bind the Purchase, and get it changed, for a good Part of it will be coming to me. The Question is to know what the Horses were sold for, and whether or no the Jockey bit the Farmer? *Answer* the Horses sold for 3632067*l.* 1*s.* 8*d.*

108 Geometrical Progression. ACCOMPTANT'S

In answering Questions in this Rule, place the Numbers thus :

0, 1, 2, 3, 4, 5, Indices.

1, 3, 9, 27, 81, 243, Terms.

N. B. Multiplying 243 by 243, you get the tenth Term, which is the Price of the 11th Horse, and explains the Meaning of the first Rule. The Ratio is the common Multiplier or Divisor.

2. A Person bought 15 Oxen on these Conditions, that for the first he was to pay 3*d.* the next 9*d.* the third for 27*d.* and so on in Geometrical Progression; what did the whole cost? *Ans.* 8968*ol.* 13*s.* 3*d.*

3. A Country Girl being at a Fair, bought herself a fine Straw Hat; a Country Fellow (ignorant in Numbers) asked her what she would sell it for; she readily answered (that as there were 27 Plats in the Hat) if he would give her a Pin for the first Plat, 3 for the second, 9 for the third, 27 for the fourth, and so on till he came to the 26th, he should have the 27th Plat in the Bargain. I demand what she valued her Hat at; remembering there are 16 Pins to a Row, and 8 Rows for a Penny? *Ans.* 82743028*l.* 5*s.* 3 $\frac{3}{4}$ *d.*

4. Suppose 17 Bushels of Wheat were sold thus, 3 Farthings for the first Bushel, 9 for the second, and 27 for the third, and so on in Geometrical Progression, what was the Price of the whole? *Ans.* 20178*l.* 10*s.* 0 $\frac{3}{4}$ *d.*

5. Suppose an House is sold on these Conditions, being elegantly finished, and consisting of 12 Doors on the Ground Floor, that is the Purchaser is to pay the Builder 4*s.* as he enters the first Door, 16 at the second Door, and 64 at the third Door, and so on in Geometrical Progression to the 12th and last Door; what was the House sold for? *Ans.* 111848*l.*

6. An Horse is sold on these Conditions; the Buyer was to give a Farthing for the first Nail, two for the second, four for the third, and so on to the 24th and last Nail, he having 4 Shoes and 6 Nails in each; what was the Price of the Horse, and what would it have been if he had had 8 Nails in a Shoe? *Ans.* the Horse was sold for 17476*l.* 5*s.* 3 $\frac{3}{4}$ *d.* if 8 Nails in a Shoe 4473924*l.* 5*s.* 3 $\frac{3}{4}$ *d.*

VARIATION OF QUANTITIES,

Shews how many several Ways any Number of Quantities may be varied with respect to their Places.

Ex-

EXAMPLES.

1. How many Changes may be rung on 12 Bells? *Answer* 479001600.

Rule, Multiply the given Terms continually one into another, and the last Product will be the Number of Changes.

2. How many different Positions may 8 Men be placed at a Table to dine? *Answer* 40320.

COMBINATION of QUANTITIES.

1. Suppose a Man had 20 Sheep, how many different Parcels of 10 each may be combined together? *Answer* 184756.

To answer QUESTIONS of this Nature.

Rule, The Number of Parcels from Unity upwards must be multiplied together continually for a Divisor, and so many of the 20 as there are Parcels must be multiplied one into another, beginning at 20, &c. downward for a Dividend, and the Quotient is the Answer.

2. Suppose a Gentleman had 15 fine Coach Horses, and he is desirous to know how many different Combinations of 6 he can have in that Number? *Answer* 5005.

ALLIGATION.

ALLIGATION consists of two Kinds, *viz.* Alligation Medial, and Alligation Alternate.

ALLIGATION MEDIAL,

Is when the Prices and Quantities are given to find the mean Price when they are mixed together.

Rule, As the whole Mixture : is to its whole Value : : so is any Quantity of Mixture : to its proportional Price.

EXAMPLES.

1. If a Cornfactor mixes 10 Bushels of Wheat, at 6s. the Bushel, with 24 Bushels of Rye, at 4s. the Bushel, with 16 Bushels of Beans, at 5s. the Bushel, and with 36 Bushels of Barley, at 2s. and 6d. the Bushel ; the Price of one Bushel of this Mixture is required? *Answer* 3s. 9½d.

2. A Vintner mixed 22 Gallons of Wine worth 2s. 4d. per Gallon, with the like Quantity of Wine worth 3s. 8d. per Gallon, and with 22 Gallons worth 4s. 6d. per Gallon; the Price of one Gallon of this Mixture is required? *Answer* 3s. 6d.

3. A Grocer would mingle 4 Pounds of Sugar at 4*d.* the Pound, with 12 Pounds at 6*d.* the Pound, and with 24*lb.* at 9*d.* the Pound ; the Value of a Pound of this Mixture is required ? *Answer* 7*d.* $\frac{1}{2}$ $\frac{2}{5}$.

4. A Person mixed 20 Gallons of Ale at 7*d.* per Gallon, with 32 Gallons at 10*d.* per Gallon, and with 42 Gallons at 12*d.* per Gallon ; the Value of one Gallon of this Mixture is required ? *Answer* 10*d.* $\frac{1}{4}$ $\frac{2}{84}$.

5. Suppose a Refiner had 15*lb.* of Silver Bullion of 8 Oz. fine, and 30*lb.* of 7 Oz. fine, and 45*lb.* of 6 Oz. fine, and he would melt them all together ; the Question is to find what fineness one Pound of the Mass will be ? *Answer*, 6 Oz. 13 Dw. 8 Grs. fine.

6. Suppose one mix 3*lb.* of Gold of 22 Carraets fine, with 9*lb.* of 18 Carraets fine, what fineness will one Ounce of this Mixture bear ? *Answer* 19 Carraets fine.

7. A Hop Merchant hath several Sorts of Hops, viz. one Sort at 2*s.* 3*d.* and another at 1*s.* 9*d.* and another at 1*s.* 3*d.* per *lb.* and he would mix an equal Quantity of each together ; I demand the Price of one Pound of this Mixture ? *Answer* 1*s.* 9*d.*

8. Suppose one mix a certain Quantity of Beans at 4*s.* 6*d.* per Bushel, with the like Quantity of Oats at 2*s.* 6*d.* per Bushel, what will the Price of a Bushel of this Mixture be ? *Answer* 3*s.* 6*d.*

ALLIGATION ALTERNATE.

THIS I shall divide into 3 Varieties, that you may perceive which of the Varieties any Question proposed Falls under.

1st, Variety is when the Price of the Things you would mix are given, but no Quantity, and it is demanded how much of each we must take to sell one Quantity or Measure at a Price proposed.

Rule, Place the Prices one over another, and the proposed Price against them, then link or place like Marks or Letters, thus (*v*) mark one Quarter, then the mean Price, with one less, and then take the Difference of each, and the mean Price, and place that Difference against the other Quantity that is marked (*v*) alike, and so proceed with the rest.

EXAMPLES.

1. A Grocer would mix Spices, some at 9*d.* per *lb.* some at 12*d.* some at 24*d.* and some at 30*d.* how much of each Sort must he take to sell a Pound for 20*d.*? Place them as directed thus :

	Price		N. B. The Difference is the
	<i>a</i> 9	4	Answer to the Question; or if
Mean 20 <i>d.</i>	<i>b</i> 12	10	you multiply the Difference by
	<i>a</i> 24	11	one common Multiplier, the se-
	<i>b</i> 30	8	veral Products would have given

Variety of Answers; so by this he must have 4*lb.* at 9*d.* 10*lb.* at 12*d.* 11*lb.* at 24*d.* and 8*lb.* at 30*d.* to make the Mixture worth 20*d.* the Pound. I have made Use of the Letters *a* and *b* instead of linking, which is more expeditious and answers the same End; you may mark 9, and 30, and 12, and 24, and the Difference would give an Answer equally true as the other.

2. Suppose one would mix three Sorts of Wine together, one at 24*d.* per Quart, another at 16*d.* the Quart, and the third at 12*d.* per Quart, how much of each Sort must he take to sell a Quart for 18*d.*? Answer 8 Quarts at 24*d.* and 6 Quarts of each of the other, or in that Proportion.

N. B. As there is but one Price larger than the mean or required Price, it must be marked to each of the other, and the Difference betwixt it and the mean placed to each, and the Difference betwixt each of the other, and the Mean must be added in one Sum, which gives the aforesaid Answer.

3. Suppose one had a Mind to mix four Kinds of Wheat at the following Prices, one at 4*s.* the Bushel, another at 3*s.* 6*d.* another at 3*s.* and the other at 2*s.* 2*d.* the Bushel, how many Bushels of each must he have that a Bushel of the Mixture may be worth 3*s.* 3*d.*? Answer 3 Bushels at 4*s.* 13 Bushels at 3*s.* 6*d.* 9 Bushels at 3*s.* and 3 Bushels at 2*s.* 2*d.* or in that Proportion.

4. A Grocer would mix three several Sorts of Tea, one at 18*s.* the *lb.* another at 16*s.* the *lb.* and a third at 12*s.* the *lb.* how much of each Sort must he take, that a Pound of the Mixture may be worth 17*s.*? Answer 6*lb.* at 18*s.* the *lb.* and one Pound of each of the other.

Variety 2*d.* Is when the Rule of all the Things, are given, and the Quantity of one of them, and the mean

3. A Grocer would mingle 4 Pounds of Sugar at 4*d.* the Pound, with 12 Pounds at 6*d.* the Pound, and with 24*lb.* at 9*d.* the Pound ; the Value of a Pound of this Mixture is required ? *Answer* 7*d.* $\frac{1}{2}$ $\frac{2}{5}$.

4. A Person mixed 20 Gallons of Ale at 7*d.* per Gallon, with 32 Gallons at 10*d.* per Gallon, and with 42 Gallons at 12*d.* per Gallon ; the Value of one Gallon of this Mixture is required ? *Answer* 10*d.* $\frac{1}{4}$ $\frac{2}{94}$.

5. Suppose a Refiner had 15*lb.* of Silver Bullion of 8 Oz. fine, and 30*lb.* of 7 Oz. fine, and 45*lb.* of 6 Oz. fine, and he would melt them all together ; the Question is to find what fineness one Pound of the Mass will be ? *Answer*, 6 Oz. 13 Dw. 8 Grs. fine.

6. Suppose one mix 3*lb.* of Gold of 22 Carraets fine, with 9*lb.* of 18 Carraets fine, what fineness will one Ounce of this Mixture bear ? *Answer* 19 Carraets fine.

7. A Hop Merchant hath several Sorts of Hops, *viz.* one Sort at 2*s.* 3*d.* and another at 1*s.* 9*d.* and another at 1*s.* 3*d.* per *lb.* and he would mix an equal Quantity of each together ; I demand the Price of one Pound of this Mixture ? *Answer* 1*s.* 9*d.*

8. Suppose one mix a certain Quantity of Beans at 4*s.* 6*d.* per Bushel, with the like Quantity of Oats at 2*s.* 6*d.* per Bushel, what will the Price of a Bushel of this Mixture be ? *Answer* 3*s.* 6*d.*

ALLIGATION ALTERNATE.

THIS I shall divide into 3 Varieties, that you may perceive which of the Varieties any Question proposed falls under.

1st, Variety is when the Price of the Things you would mix are given, but no Quantity, and it is demanded how much of each we must take to sell one Quantity or Measure at a Price proposed.

Rule, Place the Prices one over another, and the proposed Price against them, then link or place like Marks or Letters, thus (v) mark one Quarter, then the mean Price, with one less, and then take the Difference of each, and the mean Price, and place that Difference against the other Quantity that is marked (v) alike, and so proceed with the rest.

EXAMPLES.

1. A Grocer would mix Spices, some at 9*d.* per *lb.* some at 12*d.* some at 24*d.* and some at 30*d.* how much of each Sort must he take to sell a Pound for 20*d.*? Place them as directed thus :

	Price		N. B. The Difference is the
	<i>a</i> 9	4	Answer to the Question; or if
Mean 20 <i>d.</i>	<i>b</i> 12	10	you multiply the Difference by
	<i>a</i> 24	11	one common Multiplier, the se-
	<i>b</i> 30	8	veral Products would have given

Variety of Answers; so by this he must have 4*lb.* at 9*d.* 10*lb.* at 12*d.* 11*lb.* at 24*d.* and 8*lb.* at 30*d.* to make the Mixture worth 20*d.* the Pound. I have made Use of the Letters *a* and *b* instead of linking, which is more expeditious and answers the same End; you may mark 9, and 30, and 12, and 24, and the Difference would give an Answer equally true as the other.

2. Suppose one would mix three Sorts of Wine together, one at 24*d.* per Quart, another at 16*d.* the Quart, and the third at 12*d.* per Quart, how much of each Sort must he take to sell a Quart for 18*d.*? Answer 8 Quarts at 24*d.* and 6 Quarts of each of the other, or in that Proportion.

N. B. As there is but one Price larger than the mean or required Price, it must be marked to each of the other, and the Difference betwixt it and the mean placed to each, and the Difference betwixt each of the other, and the Mean must be added in one Sum, which gives the aforesaid Answer.

3. Suppose one had a Mind to mix four Kinds of Wheat at the following Prices, one at 4*s.* the Bushel, another at 3*s.* 6*d.* another at 3*s.* and the other at 2*s.* 2*d.* the Bushel, how many Bushels of each must he have that a Bushel of the Mixture may be worth 3*s.* 3*d.*? Answer 3 Bushels at 4*s.* 13 Bushels at 3*s.* 6*d.* 9 Bushels at 3*s.* and 3 Bushels at 2*s.* 2*d.* or in that Proportion.

4. A Grocer would mix three several Sorts of Tea, one at 18*s.* the *lb.* another at 16*s.* the *lb.* and a third at 12*s.* the *lb.* how much of each Sort must he take, that a Pound of the Mixture may be worth 17*s.*? Answer 6*lb.* at 18*s.* the *lb.* and one Pound of each of the other.

Variety 2*d.* Is when the Rule of all the Things, are given, and the Quantity of one of them, and the mean

Rule of the whole Mixture, to find the several Quantities of the rest in Proportion to the given Quantity.

Rule, Place them as in the last, and take the Differences as before; then say, as the Difference against the given Quantity : is to the rest of any Difference : : so is the given Quantity : to the Quantities sought, each to its respective Difference.

EXAMPLES.

1. A Tobacconist hath 30*lb.* of Tobacco at 24*d.* the *lb.* which he would mix with some at 12*d.* some at 9*d.* and some at 7*d.* the *lb.* how much of each Sort must he take to mix with 30*lb.* that he may sell a *lb.* of the Mixture for 16*d.*

16		24 <i>a</i>		4	7	9		20	Now the Proportion will stand thus,	
		12 <i>a</i>		8				8		As 20 : 8 :: 30 : 12, so that he must have 12 <i>lb.</i> of each Sort of the other to mix with 30 <i>lb.</i> of the best.
		9 <i>a</i>		8				8		
		7 <i>a</i>		8				8		

2. A Goldsmith hath 20 Ounces of Gold at 20 Carraets fine, which he would mix with some at 22 Carraets, and some at 24 Carraets fine, how much of 22 and 24 Carraets fine, and how much Alloy must he mix with 20 Ounces of Carraets fine to have an Ounce, and consequently the whole Mass at 18 Carraets fine.

18		20 <i>a</i>		18	And the Proportion will be as follows,	
		22 <i>a</i>		18		As 18 : 18 :: 20 : 20
		24 <i>a</i>		18		As 18 : 18 :: 20 : 20
		0 <i>a</i>		2		4

So that he must have 20 Ounces of each Quantity of the Gold, and 13 $\frac{1}{3}$ Ounces of Alloy.

Note, Alloy is a Sort of a coarse Silver, or Copper, or some base Metal, which Goldsmiths mix Gold or Silver with, to abate the fineness.

N. B. An Ounce of Gold is divided into 24 Parts, called Carraets, and an Ounce of Silver into 20 Parts are called Penny-Weights, and to distinguish fineness of Metals, such Gold as will abide the Fire without loss is called 24 Carraets fine; if it loses 4 Carraets in trial it is called 20 Carraets fine.

Silver is valued in Ounces; for a Pound of Silver that loseth nothing in trial is called 12 Ounces fine, but if it loseth 3 Penny-Weights, it is then said to be 11 Ounces 17 Penny-Weights fine.

3d Variety, Is when the Price of every Thing to be mixed is expressed, as well as the mean Rate or Price, and it

it is required to find how much of each Sort must be taken to make up a certain Quantity propounded agreeable to the mean Rule given.

Rule, Proceed as before, -then the Proportion will be as the total Sum of the Difference : is to the total Quantity given :: so is any particular Difference : to its particular Quantity sought.

EXAMPLES.

1. A Merchant would mix 4 Sorts of Wine, of several Prices, one at 6 Shillings the Gallon, another at 8 Shillings, the third at 11 Shillings, and the other at 15 Shillings *per* Gallon; of these he would have a Mixture to contain 50 Gallons, and the Price to be 9 Shillings *per* Gallon, what Quantity must he have of each Sort of Wine? Proceed thus,

9s.	$\left \begin{array}{l} 6a \\ 8b \\ 11a \\ 15b \end{array} \right $	2	Then As 12 : 50 :: 2 : $8\frac{1}{3}$
		6	As 12 : 50 :: 6 : 25
		3	As 12 : 50 :: 3 : $12\frac{1}{2}$
		1	As 12 : 50 :: 1 : $4\frac{1}{6}$
		12	50 Proof

2. A Goldsmith would mix Gold of 24 Carraets fine with some of 23, some of 22, some of 18, some of 16, and some of 15 Carraets fine, so that he may have 100 Ounces of 20 Carraets fine; how much must he take of each Sort? *Answer*, he must take as in the following Manner, beginning with the first, and so to the last.

$\begin{array}{r} 24 \\ 23 \\ 22 \\ 18 \\ 16 \\ 15 \end{array} \left| \begin{array}{r} 20 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \end{array} \right| 100$

N. B. By differently marking them, you have Variety of Answers.

POSITION

DISCOVERS the true Number sought by supposed Numbers, and consists of two Parts, *viz.* Single and Double.

Of SINGLE POSITION.

This discovers the Answer to the Question demanded by one supposed Number.

EXAMPLES.

1. A Shepherd being asked how many Sheep he had in his Flock, answered, that $\frac{1}{2}$ of the Number being added to $\frac{1}{3}$ and $\frac{1}{4}$ of the same Number, the Sum of such Addition would be 195, how many Sheep were in the Flock? *Answer*, 180.

To answer this Question (or any of the like) you may suppose he had what Number you please; as for Example, suppose he had 60 Sheep, then you will find that the Sum of $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$, will be but 65, which according to the Question should have been 195, then say by the Rule of Three,

$$\text{If } 65 \text{ ————— } 60 \text{ ————— } 195$$

60

$$65) 11700 (180$$

2. A Gentleman being demanded how old he was, answered, that $\frac{1}{3}$, $\frac{1}{6}$, and $\frac{1}{12}$ of the Years he had seen would make the Sum 28; what was his Age? *Answer*, 48 Years.

3. Three Graziers, A, B, and C, traded together, and gained 135*l.* of which A took up a certain Sum, B took up twice as much as A, and C took up thrice as much as B; how much did each Man receive of the Gain? *Answer*. A 15*l.* B 30*l.* and C 90*l.*

4. A Man having the Fortune to find a Sum of Money, was demanded the particular Number of Pieces, but he gave for Answer, that $\frac{2}{3}$ when it was added to $\frac{1}{9}$ he found the Number 28; how many Pieces did he find? *Answer*. 63.

5. A General being demanded the Number of his Men, answered, that $\frac{1}{3}$ of $\frac{1}{6}$ of his Army amounted to 1260 Men; what Number of Men had he? *Answer*. 22680.

6. Two Men discoursing of the Number of Crowns in their Pockets, one says to the other, I know if we put our Crowns together, the $\frac{1}{4}$ and $\frac{1}{8}$ of them will be 36; right, says the other, for $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{1}{6}$ of them I know to be 72; what Number had they? *Answer*. 96.

DOUBLE POSITION,

IS that which discovers the Answer to Questions in this Rule, by making use of two Positions, and working by them supposed Numbers according as the Questions direct.

EXAMPLES.

1. Three Men, A, B and C, were left 591*l.* in the following

lowing Manner, A, was to have a certain Sum, and B was to have 54*l.* more than A, and C 72*l.* more than B, what Number of Pounds had each? *Answer*, A 137*l.* B 191*l.* and C 263*l.*

To get the Answer do thus; suppose A to have 120*l.* then B must have 174*l.* and C 246*l.* according to the Question, whose Sum should have been 591, which Supposition gives an Error of 51*l.* too little, then make a Cross and place it thus,

120	130	Now Suppose again A to have 130 <i>l.</i> B 184 <i>l.</i>
X		and C 256 <i>l.</i> this Sum will be but 570 <i>l.</i>
		which as before should have been 591 <i>l.</i> and
51	21	gives the second Supposition an Error of

21*l.* too little, which must be placed as you see the above furnished Cross.

Now to get the true Answer do thus; multiply cross ways, that is, 51 by 130, and 21 by 120, and subtract the less Product by the greater, and the Remains will be your Dividend, that is 4110; then subtract one Error from the other, that is 21 from 51, and 30 will remain for your Divisor, and the Quotient will be found 137, the Number of Pounds A must have, and by Addition to get B's and C's.

N. B. If the Errors are alike, that is, both too little or both too much, you must proceed according to the Rule delivered.

But if the Errors are unlike, that is, one too much and the other too little, then add your Products for a Dividend, and your Errors for a Divisor, and the Quotient will be the Answer as before, which you may make Proof of at your Pleasure.

2. What Number is that which multiplied by 9, and 30 added to the Product, will be equal to the same Number multiplied by 14? *Answer*, 18.

3. Good morrow Neighbour with your hundred Lambs. Friend, I have not 100, but if I had as many, $\frac{1}{2}$ as many, 2 Lambs and $\frac{1}{2}$, I should have 100. How many had he? *Ans^w*. 39.

4. Suppose an Army whose Foot are 8 Times the Number of Horse, and 18,000 Shillings to pay the same for one Week, the Horse received 12*s.* per Man, and the Foot but 3, what was the Number of each? *Ans^w*. 500 Horse and 4000 Foot.

5. A, B and C found a Chest containing a certain Number

ber of Pounds, and when they divided the Booty A and B's Share amounted to 47 Pounds, B and C's to 88 Pounds, and A's and C's to 71 Pound? what was the Sum found, and each Man's Share? *Answer*, the Sum found was 103*l.* A's Share 15*l.* B's Share 32*l.* and C's 56*l.*

6. A Gentleman made a Purchase of a Country House, a fine Garden, and a very genteel Horse, for 1200*l.* he paid 4 times the Price of the Horse for the Garden, and 5 times the Price of the Garden for the House; I demand the Price of the House, the Garden, and the Horse separately? *Answer*, the House 960*l.* the Garden 192*l.* and the Horse 48*l.*

7. Suppose a Man was to finish a piece of Work in 60 Days, and every Day he works he is to have 5*s.* 6*d.* and every Day he plays he is to forfeit 4*s.* 2*d.* and when the Work was finished he received according to Agreement the Sum of 7*l.* 16*s.* how many Days did he work, and how many did he play? *Answer*, he worked 42 and played 18.

EXTRACTION of the SQUARE ROOT.

THE Square Root of a Number, is a Number which being multiplied by itself, produceth the given Number; or it is a mean Proportional betwixt the given Number and Unity.

Root 1 2 3 4 5 6 7 8 9

Square 1 4 9 16 25 36 49 64 81

Rule. Point off every two Figures, beginning at the Units Place, and the Number of Points shews the Number of Figures the Root will have.

Take the nearest square Number in the first Point, and subtract it therefrom, place the Root in the Quotient, and bring down the next two Figures to the Remainder for a Dividend.

Find a Divisor by doubling the Quotient; seek how often the Divisor is contained in the Dividend (reserving always the Unit's Place) and place the Answer in the Quotient, and likewise on the right hand of the Divisor; multiply by the last Figure in the Quotient, that product subtract from the Dividend, and if there be any more Figures, bring down the two next to the Remainder, and work as before.

Ex-

EXAMPLES.

1. What is the Square Root of 58564?

$$\begin{array}{r}
 58564 \overline{)242} \\
 \underline{4} \\
 44 \overline{)185} \\
 \underline{176} \\
 482 \overline{)964} \\
 \underline{964}
 \end{array}$$

In this Manner you must proceed with every Operation, always bringing down two Figures at a time; and if the Number to be extracted consists of Decimals, they must be an even Number, or made so by adding a Cypher or Cyphers at Discretion, before you begin to point.

2. What is the Square Root of 451584? *Answ.* 672.
 3. What is the Square Root of 69696? *Answ.* 264.
 4. What is the Square Root of 315844? *Answ.* 562.
 5. What is the Square Root of 964324? *Answ.* 982.
 6. What is the Square Root of 2637376? *Answ.* 1624.
 7. What is the Square Root of 138384? *Answ.* 372.
 8. What is the Square Root of 7612,5625? *Answ.* 87,25.
 9. What is the Square Root of 315,0625? *Answ.* 17,75.
 10. What is the Square Root of 784762? *Answ.* 885, and a Remains of 1537. Now if to the Remains you add two Cyphers, and proceed as before, you get the Decimals of the Root; continually to every Remains add two Cyphers, and you may have as many Places of Decimals as you like.
- But if you would have your Root expressed as a Vulgar Fraction, do thus; when you have found the integral Part of the Root, multiply it by 4, and to the Product add the Unity, and that is your Denominator, and the double of the Remainder is your Numerator; by this your Root will be $885\frac{3074}{3541}$.
11. What is the Square Root of 674637? *Answ.* 821,36289, and a Remainder of 29308479.
 12. Extract the Square Root of $\frac{1}{2}$ to 4 Places of Decimals, and it will stand thus, ,500000? *Answ.* 2236 and a Remainder of 304.

To extract the SQUARE ROOT of a VULGAR FRACTION.

REDUCE the Fraction to its lowest Terms, then extract the Square Root of the Numerator for a new Numerator, as also of the Denominator for a new Denominator.

If the Fraction be a Number whose Root cannot be exactly found, bring it to a Decimal, and extract the Root from it.

When a mixt Number, reduce it to an improper Fraction, and then proceed as above directed.

EXAMPLES.

1. What is the Square Root of $\frac{1296}{3600}$? *Answ.* $\frac{3}{5}$.
2. What is the Square Root of $\frac{324}{1764}$? *Answ.* $\frac{3}{7}$.
3. What is the Square Root of $\frac{2401}{3136}$? *Answ.* $\frac{7}{8}$.
4. What is the Square Root of $\frac{274}{391}$? *Answ.* 837,
5. What is the Square Root of $\frac{253}{878}$? *Answ.* 5368,
6. What is the Square Root of $20\frac{1}{4}$? *Answ.* $4\frac{1}{2}$.
7. What is the Square Root of $21\frac{2}{3}$? *Answ.* 4,68.

QUESTIONS to exercise the SQUARE ROOT.

To find a mean Proportional betwixt any two Numbers.

Rule. Multiply the given Numbers together, and extract the Square Root of the Product, which Root will be the mean Proportional sought.

EXAMPLES.

1. What is the Mean betwixt 64 and 49? *Answ.* 56.
2. What is the Mean betwixt 144 and 121? *Answ.* 132.

To find the side of a SQUARE equal in AREA to any given SUPERFICES whatsoever.

Rule. Find the Root of the given Area, and the Root is the Side of the Square sought.

EXAMPLES.

1. If the Area of a Circle be 160, what is the Side of a Square equal in Area to the given Circle? *Answ.* 12,64911, and a Remainder of 162079, or by the Rule given; if you would have it expressed as a Vulgar Fraction it will be $12\frac{32}{49}$.

2. The Area of a Triangle is 784, what is the Side of a Square equal to the same? *Answ.* 28.

3. Suppose a General had an Army of 138384 Men, and he would form them into a Square, how many Men must be in Rank and File? *Answ.* 372; the Number of Rank and File.

Note. If you would have the Number of Men be double, triple or quadruple, &c. as many in Rank as in File: then, extract the Square Root of $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, &c. the given Number of Men, and that will be the Number of Men in File, which double, triple, &c. that Number is the Men in Rank.

4. Let 8192 be formed into an oblong, so that the Number of Men in Rank may be double the File? *Answ.* 64 in File and 128 Men in Rank.

5. Let 12132 Men be placed so that there shall be 18 in Rank, how many must be in File?

To answer Questions in this Nature, say, by the Rule of Three, as the Number of Men in Rank: is to the whole Number:: so is Unity: to the Number of File; so this Question will stand thus;

As 18 : 12132 :: 1 : 674, the Number of Men in File.

6. Let it be required to place 6068 Men so that they may be 82 in Rank, and 74 in File, and they to stand in Order, that is, three Feet distant in Rank, and as much in File; the Question is to find how much Ground they stand on.

To answer this, or any of the Kind, say, by the Rule of Three, as Unity: is to the Distance:: so is the Number in Rank less by one: to a fourth Number; and do the same by the File, and multiply the two Numbers found by the Rule of Three together, and the Product will be the Answer to the Question, and will stand thus:

As 1 : 3 :: 81 : 243

As 1 : 3 :: 73 : 219

And 243 multiplied by 219 gives the Answer 53217, and so many square Feet of Ground they stand on.

Note. I have given the two preceding Questions a Place here, though not belonging to the square Root; and will be found of Use in planting Trees, as well as placing Men, you having the Distance of Ground betwixt each given.

7. Suppose a Gentleman would plant on a waste Piece of Ground 864 young Trees, so that the Length shall be to the Breadth as 3 to 2, and the Distance of each Tree from one another 18 Yards; the Question is, how many Trees must be in Length and how many in Breadth, and how many square Yards of Ground they stand on.

To resolve any Question of this Nature do thus; say, by the Rule of Three, as the Ratio in Length : is to the Ratio in Breadth : : so is the Number of Trees : to a fourth Number, whose square Root is the Number in Breadth; and as the Ratio in Breadth : is to the Ratio in Length : : so is the whole Number : to a fourth, whose Root is the Number in Length; by this you will find the Number in Length 36, and in Breadth 24, and by the last Example the Quantity of Ground 260820 square Yards.

8. Suppose a General gives 777*l.* 12*s.* to reward a certain Number of Men who had signalized themselves in an Action, and they upon Examination of the Money, found that each had received in Value as many four pences as they were Men in Number, how many Men were there?

Answer 216.

Note, In the 47th Proposition of the first Book of Euclid it is proved, the Square of the Hypothenuse is equal to the Sum of the Squares of the Base and Perpendicular, or the other two Sides.

So by this if we have two Sides given, the third may be found.

9. Suppose a Tower be 33 Yards high, and it is surrounded by a Ditch 44 Yards wide, how long must a line be to reach from the Top of the Tower to the opposite Side of the Ditch? *Answer.* 55 Yards; found by squaring the Height of the Tower and the Breadth of the Ditch, and adding the Squares into one Sum; the square Root of which gives the Length of the Line.

EXTRACTION of the CUBE-ROOT.

THE Cube-Root of a Number is such, which being multiplied by itself twice, produceth the given Number; thus the Cube-Root of 7 is 343, and the Root of 216 will be 6; and so of other Numbers, as in the following Table.

Root

Root	1	2	3	4	5	6	7	8	9
Cube	1	8	27	64	125	216	343	512	729

Rule, The Root of any single Number is found by the Table; but if it be a compound Cube Number it must be pointed thus; make a Point under the Units Place, and omitting two Points every third Figure, and as many Points as the Number contains, so many Figures will your Root contain.

Then take the nearest Cube Number to your first Period to the left Hand, by the Table, whose Root place in the Quotient, then subtract its Cube from the Period, and to the Remainder (if any) bring down three Figures on your next Period, and call it your Dividend, then call your Quotient Figure, with a Cypher joined to it, *r*, and square that Number, and multiply that Square by 3, and this Product call your Divisor, and proceed as in Division, only with this Difference; call your next Quotient Figure, *e*, and multiply your Divisor by it, and place it under your Dividend, then multiply the Number you called *r*, by 3, and this Product by the Square of that Figure you called *e*, and place it also under the Dividend; lastly, Cube the Figure you called *e*, and place it under the Dividend, then add the three several Sums into one and subtract this Last from your Dividend, and to the Remainder bring down your next Period, and proceed as before: Examples will make it more plain than a Multitude of Words.

Note, If you take any Number and cube it, and then extract the Root of that Number, it will make the Operation more easy, because by this Method you know what the Root should be.

Proof, Cube the Root found, and to the Product add the Remainder (if any) and that Sum will be the same as the Number given to be extracted.

EXAMPLES.

Cube 672, and it will be found 303464448, then extract the Root of this Number and the Work will stand thus;

M

3034

$$\begin{array}{r} \cdot \cdot \cdot \\ 303464448(672 \\ \underline{216} \end{array}$$

3 *rr* is 10800)87464 the Dividend

$$\begin{array}{r} 75600 \text{ this is } 3rre \\ 8820 \text{ this is } 3ree \\ 343 \text{ this is } eee \end{array}$$

r is 670

84763 this is the Subducend

3*rr* is 1346700) 2701448 the Dividend

$$\begin{array}{r} 2693400 \text{ this is } 3rre \\ 8040 \text{ this is } 3ree \\ 8 \text{ this is } eee \end{array}$$

2701448 Subducend

0

N. B. Any two Letters joined together signify the Square, as thus; *rr* shew that the Number represented by *r* must be squared, and 3*rr* that that Square must be multiplied by 3, and 3*rre* that this last must be multiplied by that Number represented by *e* and *eee*, that the Number represented by *e* must be cubed; the first *r* is 60, and the first *e* 7, your second *r* is 670, and the second *e* is two, and in this manner you must proceed to change your *r* every Period you bring down, and the *e* is always the last Figure you place in the Quotient after the first, as you may perceive by observing the last Example.

2. What is the Cube Root of 262144? *Answ.* 64.
3. What is the Cube-Root of 5639752? *Answ.* 178.
4. What is the Cube-Root of 52734375? *Answ.* 375.
5. What is the Cube-Root of 912673000? *Answ.* 970.
6. What is the Cube-Root of 810844866729? *Answ.* 2009.
7. What is the Cube-Root of 307273580992? *Answ.* 6748.
8. What is the Cube-Root of 41,063625? *Answ.* 3,45
9. What is the Cube-Root of 13227,977125? *Answ.* 23,65.

10. What is the Side of a Cubical Vessel which shall contain a Gallon of Ale, it being 182 solid Inches? *Ans.* 6,557 Inches, and a Remainder of 86709307.

Note, When you will have your Root consist of Decimal Places, you must always bring down three Decimals, or three Cyphers, to supply the want of Decimals in every Period.

11. What is the Cube-Root of 306591,054407? *Ans.* 67,43.

12. The Solidity of a Cube is 262,144 Inches, what is the Side of that Cube? *Answer* 6,4 Inches.

13. What is the Cube-Root of 12,812904? *Ans.* 2,34.

Note, If the Cube-Root of any Fraction is required, reduce such Fraction into a Decimal of 3, 6, 9, or 12, Places, &c. as you desire your Root to be more or less exact, and then proceed as before.

14. What is the Cube-Root of $\frac{1}{2}$ the Beginning of the Work to three Places of Decimals? will stand thus, .500000000, and the Answer will be found 793, and a Remainder of 1322743.

To extract a Cube-Root of a Vulgar-Fraction.

Rule, Reduce the Fraction to its lowest Terms, then extract the Cube-Root of the Numerator for a new Numerator, as also of Denominator for a new Denominator.

If the Fraction be a Surd bring it to a Decimal and extract the Root from it.

When a mixed Number reduce it to an improper Fraction, then proceed according to the foregoing Rules.

EXAMPLES.

1. What is the Cube-Root of $\frac{27}{125}$? *Answer* $\frac{3}{5}$.
2. What is the Cube-Root of $\frac{27}{343}$? *Answer* $\frac{3}{7}$.
3. What is the Cube-Root of $\frac{512}{2744}$? *Answer* $\frac{4}{7}$.
4. What is the Cube-Root of $\frac{3}{7}$? *Answer* ,349
5. What is the Cube-Root of $\frac{2}{3}$? *Answer* ,873.
6. What is the Cube-Root of $15\frac{5}{8}$? *Answer* $2\frac{1}{2}$.
7. What is the Cube-Root of $9\frac{5}{7}$? *Ans.* 2,113.

To find two mean Proportionals betwixt any two given Numbers.

Rule, Divide the Greater by the Less, and extract the Cube-Root of the Quotient, which Root multiply by the least of the given Numbers, and the Product will be the least, and it being multiplied by the same Root gives the greatest.

EXAMPLES.

1. Find two mean Proportionals between 3 and 81?
Answer, 9 and 27.

2. Find two mean Proportionals between 8 and 5832?
Answer. 72 and 648.

QUESTIONS to exercise the CUBE ROOT.

Rule. Like Solids are in Proportion as the Cubes of their like Sides, Diameters, Lines, &c. : is to the given Weight, Value, Capacity, &c. : : so is the cube of the Side, Diameter, Lines, &c. : whose Weight, Value or Capacity is required to its Weight, Value or Capacity.

EXAMPLES.

1. If a Bullet, whose Diameter is 4 Inches, weighs 9 Pounds, what will a Bullet of the same Metal weigh whose Diameter is 8 Inches?

First, Cube 4; the Diameter of the Bullet whose Weight is given, and it will be 64; then Cube 8, the Diameter of the Bullet whose Weight is required, and it will be 512; then say by the Rule of Three,

As 64 *CD* : 9*lb.* : : 512 *CD*, the Answer will be found 72 Pound.

2. If the Diameter of a Globe be one Inch, and the Solidity of the same, 5238 of an Inch, what is the Solidity of another Globe whose Diameter is 10 Inches? *Answer*. 523,8 Inches.

3. If a Globe of Silver of one Inch Diameter be in Value 14,4 Shillings, what is the Value of another Globe of the same Silver whose Diameter is 4 Inches? *Answer*, 921,6 Inches.

If a Gun, whose Diameter at the Bore is 3,75 Inches, require 4*lb.* of Powder for its Charge, what will one whose Diameter at the Bore is 6,5 Inches, require for its Charge? *Answer*. 20,83*lb.* of Powder.

5. If the Diameter of a Piece of Ordnance be 11,5 Inches, and its Weight 1000*lb.* what will another Piece of Ordnance of the same Metal weigh, whose Diameter is 8,75 Inches? *Answer*. 440,484*lb.* Weight.

6. If a Ship whose Burthen is 300 Tons, be 75 feet in the Keel, what will be the Burthen of another Ship (of the same Mould) whose Keel is 100 Feet? *Answer*. 711,111 Tons.

7. If a Bullet whose Diameter is 4 Inches weighs 9lb. what is the Diameter of another Bullet of the same Metal, whose Weight is 72lb. *Answer*, 8 Inches.

8. If the Diameter of a Globe be one Inch, and the Solidity ,5238 of an Inch, what is the Diameter of another Globe whose Solidity is 523,8 Inches? *Answer* 10 Inches.

9. If a Globe of Silver, of one Inch Diameter, be worth 14,4 Shillings, what will be the Diameter of another Globe of Silver that is in Value 921,6 Shillings? *Answer*, 4 Inches.

Note. To find the Side of a Cube equal in Solidity to any given Solid, as a Globe, Cylinder, Prism, Cone, &c. the Cube Root of the Solid Content gives the Side of the Cube equal to such Globe, Cylinder, Prism, Cone, &c.

10. A Cubic Cistern, each Side 3 Feet, how many Gallons of Water will it hold, admitting 282 solid Inches to a Gallon? *Answer*, 165,4468 Gallons.

11. I agreed with a Plumber to make a Cubic Cistern to hold 100 Gallons of Water, I desire to know the Length of one of its Sides. *Answ.* 30,438 Inches.

12. A Malster agreed with a Carpenter to make him a Square Bing to hold 40 Quarters of Barley; what is the Length of one of its Sides, admitting $2150\frac{4}{10}$ solid Inches to a Winchester Bushel? *Answ.* 7 Feet 4,3 Inches.

S I M P L E I N T E R E S T

IS the Profit allowed by the Borrower to the Lender, after the Rate of so much for every 100 Pound for a Year, and so in Proportion for a greater or lesser Sum; and for a longer or shorter Time, and according to the laws of *England* ought not to exceed 5 Pounds for the Use of 100l. for one Year, and so in Proportion for any Sum and for any Time.

The Ratio of any Rate of Interest is found by the following Proportion, for one Pound for a Year, as 100 l: is to the Rate of Interest :: so is one Pound : to the Ratio.

A TABLE of RATIOS, from one Pound, &c. to Ten Pounds.

Rate per C	Ratios.	Rate per C.	Ratios.	Rate per C.	Ratios.
1	,01	4	,04	7	,07
$1\frac{1}{4}$	,0125	$4\frac{1}{4}$	,0425	$7\frac{1}{4}$	,0725
$1\frac{1}{2}$	,015	$4\frac{1}{2}$	,045	$7\frac{1}{2}$	,075
$1\frac{3}{4}$	,0157	$4\frac{3}{4}$	,0475	$7\frac{3}{4}$	,0775
2	,02	5	,05	8	,08
$2\frac{1}{2}$	,0225	$5\frac{1}{4}$	,0525	$8\frac{1}{4}$	,0825
$2\frac{1}{2}$	,025	$5\frac{1}{2}$	,055	$8\frac{1}{2}$	,085
$2\frac{3}{4}$	,0275	$5\frac{3}{4}$	,0575	$8\frac{3}{4}$	,0875
3	,03	6	,06	9	,09
$3\frac{1}{4}$	,0325	$6\frac{1}{4}$	,0625	$9\frac{1}{4}$	,0925
$3\frac{1}{2}$	,035	$6\frac{1}{2}$	,065	$9\frac{1}{2}$	,095
$3\frac{3}{4}$	,0375	$6\frac{3}{4}$	,0675	$9\frac{3}{4}$	,0975
				10	,1

SECTION I.

To find the INTEREST and AMOUNT.

GENERAL RULE.

Multiply the Principal, Time and Ratio with one another, and the Product is the Interest, (commission, or Brokage, &c.) to which if you add the Principal the Sum is the Amount.

EXAMPLES.

1. What is the Interest and Amount of 342*l.* at 5 per Cent. per Annum for 8 Years? *Ans.* 136*l.* 16*s.* Interest, and the Amount is 478*l.* 16*s.*

2. What is the Interest and Amount of 792*l.* at 5 per Cent. per Annum for one Year? *Ans.* 39*l.* 12*s.* Interest and Amount 831*l.* 12*s.*

3. What comes my Factor's Commission to, when he has bought Goods upon my Account to the Amount of 5049*l.* 10*s.* when I allow him $2\frac{1}{4}$ per Cent? *Ans.* 113*l.* 12*s.* $3\frac{3}{4}$, 2.

4. If my Correspondent is to have $1\frac{3}{4}$ per Cent. what will his Commission amount to at 5638*l.* 2*s.* 8*d*? *Answer,* 98*l.* 13*s.* 4*d.* 16.

5. If an Auctioneer is to have 4 Shillings *per Cent.* for selling Goods, what must he have when he sells to the Amount of 4905*l.* 1*s.* 6*d.* *Answer.* 9*l.* 16*s.* 2 $\frac{3}{4}$ *d.*, 744.

6. What will 9657*l.* 9*s.* 4 $\frac{3}{4}$ *d.* amount to at 4*l.* 17*s.* 9*d.* *per Cent. per Annum*, for 59 Years, 7 Months and 27 Days? *Answer*, 37812*l.* 5*s.* 8 $\frac{1}{2}$ *d.*

SECTION II.

When the Principal is required, this General Rule discovers it.

Rule, Multiply the Ratio by the Time, to the Product add Unity, by that divide the Amount; and the Quotient is the Principal.

EXAMPLES.

1. What Principal will amount to 874*l.* 5*s.* in 6 Years, at 5 *per Cent. per Annum*? *Answer*, 672*l.* 10*s.*

2. What Principal will amount to 1104*l.* 8*s.* 7*d.* .05 in 6 $\frac{1}{2}$ Years at 4 *per Cent. per Annum*? *Answer*, 876*l.* 10*s.* 7 $\frac{1}{2}$ *d.*

3. What Principal will amount to 100*l.* in 4 Years at 5 *per Cent. per Annum*? *Answer*, 83*l.* 6*s.* 8*d.*

4. Suppose a Person has a Sum of Money, which if he puts out at 5 *per Cent. per Annum* for 5 $\frac{1}{2}$ Years it will amount to 1000 Pounds; what Sum had he? *Answer*, 714*l.* 6*s.* 3 $\frac{1}{4}$ *d.*, 2244.

REBATE OR DISCOUNT

Comes under this Rule; for if we call the Sum to be discounted a Principal, this Rule will discover the present Worth.

EXAMPLES.

5. What is the present Worth of 1000*l.* in one Year, at 6 *per Cent*? *Answer*, 943*l.* 7*s.* 11*d.* .094.

6. What is the present Worth of 500*l.* for 3 Years, at 5 *per Cent*? *Answer*, 434*l.* 15*s.* 7 $\frac{3}{4}$ *d.* .3.

7. What is the present Worth of 464*l.* for 4 Years, at 4 *per Cent*? *Answer*, 400*l.*

8. What is the present Worth of a Legacy of 5152*l.* payable in one Year, and $\frac{3}{4}$ Rebate being 4 *per Cent*? *Answer*, 4814*l.* 19*s.* 0 $\frac{3}{4}$ *d.* .14.

N. B. The Proof of this Question depends upon the first Rule, with this Difference only, there it is called Amount, and here the Sum; so that to give the same Rule again is needless.

Ex.

EXAMPLES.

1. If I receive 943*l.* 7*s.* 11*d.*, 094 for a Sum of Money due at the Expiration of one Year, allowing 6 *per Cent.* for present Payment, what Sum was due at first? *Ans*w. 1000*l.*
2. If I receive 434*l.* 15*s.* 7 $\frac{3}{4}$ *d.*, 3 for a Sum of Money due in 3 Years, allowing 5 *per Cent.* for present Payment, what was the Sum due at first? *Ans*w. 500*l.*
3. If I receive 400*l.* for a Sum of Money due in 4 Years, allowing 4 *per Cent.* for present Payment, what was the Sum due? *Ans*w. 464*l.*
4. Suppose one receives 4814*l.* 9*s.* 0 $\frac{3}{4}$ *d.*, 14, for a Legacy due in one Year and $\frac{3}{4}$, allowing 4 *per Cent.* for present Payment, what was the Sum due? *Ans*w. 5152*l.*

SECTION I.

When the Amount, Principal and Time are given to find the Rate of Interest, the following Rule directs.

Rule. From the Amount subtract the Principal, and divide the Remainder by the Time multiplied by the Principal and the Quotient will be the Ratio.

EXAMPLES.

1. At what Rate *per Cent.* will 342*l.* amount to 478*l.* 16*s.* to continue 8 Years? *Ans*w. at 5 *per Cent.*
2. At what Rate *per Cent.* will 792*l.* amount to 831*l.* 12*s.* in one Year? *Ans*w. at 5 *per Cent.*
3. If one receives 400*l.* for 464*l.* which would become due in 4 Years, at what Rate *per Cent.* was the Discount allowed for present Payment? *Ans*w. 4 *per Cent.*
4. If one receives 4814*l.* 19*s.* 0 $\frac{3}{4}$ *d.* for the Sum of 5125*l.* which would have been due in one Year and $\frac{3}{4}$, at what Rate *per Cent.* was allowed Discount in consideration of the present Payment? *Ans*w. at 4 *per Cent.*

SECTION II.

If the TIME is required.

General Rule, From the Amount subtract the Principal and divide the Remainder by the Ratio multiplied by the Principal, and the Quotient is the Time.

EXAMPLES.

1. In what Time will 342*l.* amount to 478*l.* 16*s.* at 5 *per Cent*? *Ans*w., 8 Years.

2. In what Time will 792*l.* amount to 831*l.* 12*s.* at 5 per Cent. *Answ.* 1 Year.
3. In what Time will 672*l.* amount to 846*l.* 14*s.* 4 $\frac{3}{4}$ *d.* at 4 per Cent? *Answ.* 6 Years and $\frac{1}{2}$.
4. In what Time will 3600*l.* amount to 9540*l.* at 5 per Cent? *Answ.* in 13 Years.

ANNUITIES or PENSIONS in ARREARS,

Is such when Annuities or Pensions are payable every Year, Half Year or Quarter, and are unpaid for any Number of Payments, allowing simple Interest at a certain Rate per Cent. per Annum for each Payment, from the Time it comes due.

SECTION I.

To find the Amount of such Annuity.

Rule. Multiply the Time by itself, and that Product by the Annuity, from this subtract the Product of the Annuity multiplied by the Time; and divide the Remainder by 2; this Quotient multiply by the Ratio of the Interest; and to this Product add the Time multiplied by the Annuity, and the Sum is the Amount.

EXAMPLES.

1. If an Annuity of 100*l.* be forborn 6 Years, what will it amount to in that Time, allowing 6 per Cent. *Answer*, 690*l.*
2. If the Payment of a Pension be omitted for 8 Years, what will be the Amount in that Time, when 6 per Cent. is allowed and the Pension is 80*l.* per Annum? *Answer* 774*l.* 8*s.*
3. Suppose an House is let upon a Lease for 14 Years at 70*l.* per Annum; what is the Amount for that Time at 5 per Cent. for the Forbearance of Payment? *Answer* 1298*l.* 10*s.*
4. Suppose a Salary of 500*l.* per Annum be forborn 9 Years, what is the Amount at 4 $\frac{1}{2}$ per Cent? *Answer* 5310*l.*

Note, If the Annuities or Rents, &c. are paid half Yearly, then take $\frac{1}{2}$ the Ratio, $\frac{1}{2}$ the Annuity, Rents, &c. and twice the Number of Years. But if the Payments are quarterly take $\frac{1}{4}$ of the Ratio, and $\frac{1}{4}$ of the Annuity, Rent, &c. and four times the Number of Years and work as before.

Ex-

EXAMPLES.

1. If 100*l.* Annuity payable every half Year were unpaid 6 Years, what will it amount to in that Time, at 6 *per Cent*? *Answer* 699*l.*

2. If 100*l.* Annuity payable every Quarter were unpaid 6 Years, what will it amount to in that Time at 6 *per Cent*? *Answer* 703*l.* 10*s.*

SECTION II.

When the AMOUNT, RATE of INTEREST, and the TIME are given to find the ANNUITY.

Rule, Divide twice the Amount, by the Square of the Time, multiplied by the Ratio, to which Product add twice the time; and from that Sum Subtract the Time multiplied by the Ratio, and the Quotient is the Annuity, Pension, &c.

EXAMPLES.

1. If the Amount of an Annuity for 6 Years at 6 *per Cent.* be 690*l.* what is the Annuity? *Answer.* 100*l.*

2. If the Amount of a Pension for 8 Years at 6 *per Cent.* be 774*l.* 8*s.* what is the Pension? *Answer.* 80*l.*

3. Suppose a House be to lett upon a Lease for 14 Years, and the Amount for that Time is 1298*l.* 10*s.* at 5 *per Cent.* what is the Rent? *Answer.* 70*l.*

4. If a Salary amounts to 5310*l.* in 9 Years at 4½ *per Cent.* what is the Salary? *Answer.* 500*l.*

Note, When the Payments are half Yearly, you must divide 4 times the Amount, and if quarterly 8 times the Amount is your Dividend, and proceed as before.

EXAMPLES.

1. If the Amount of an Annuity payable half yearly, for 6 Years at 6 *per Cent.* be 699*l.* what is the Annuity? *Answer.* 100*l.*

2. If the Amount of an Annuity payable Quarterly for 6 Years at 6 *per Cent.* be 703*l.* 10*s.* what is the Annuity? *Answer.* 100*l.*

SECTION III.

When the ANNUITY, AMOUNT, and TIME are given to find the RATE of INTEREST.

Rule, From twice the Amount, subtract twice the Annuity multiplied by the Time, and divide the Remainder by

by the Square of the Time multiplied by the Annuity, made less by the Time multiplied by the Annuity, and the Quotient is the Ratio of the Interest.

EXAMPLES.

1. If an Annuity of 100*l.* *per Annum* amounts to 690*l.* in 6 Years, what was the Rate *per Cent*? *Answ.* 6*l.*
2. If a Pension of 80*l.* *per Annum* amounts, in 8 Years, to 774*l.* 8*s.* what is the Rate *per Cent*? *Answ.* 6*l.*
3. If a House let for 14 Years at 70*l.* a Year, amounts to 1298*l.* 10*s.* what is the Rate *per Cent*? *Answ.* 5*l.*
4. If a Salary of 500*l.* *per Annum*, in 9 Years, amounts to 5310*l.* what is the Rate *per Cent*? *Answ.* 4*l.* $\frac{1}{2}$.

SECTION IV.

When the ANNUITY, AMOUNT, and RATE are given to find the TIME.

Rule, Divide 2 by the Ratio, and from the Quotient subtract Unity, then square the Remainder, and divide the Square by 4, to this Quotient add twice the Amount, divided by the Annuity multiplied by the Ratio, and extract the square Root of this last Sum. Lastly from this Root subtract half the Number found by dividing 2 by the Ratio, and the Remains of this last Number is the Time.

EXAMPLES.

1. In what Time will 100*l.* *per Annum* amount to 690*l.* at 6 *per Cent*? *Answ.* 6 Years.
2. In what time will a Pension of 80*l.* *per Annum* amount to 774*l.* 8*s.* at 6 *per Cent*? *Answ.* in 8 Years.
3. If an House be lett upon a Lease for 70*l.* *per Annum*, and the Amount be 1298*l.* 10*s.* at 5 *per Cent*. I demand the Time it was let for? *Answ.* 14 Years.
4. If a Salary of 500*l.* *per Annum*, in a certain Time at $4\frac{1}{2}$ *per Cent*. amounts to 5310*l.* I demand the Time of Forbearance? *Answ.* 9 Years.

Of the present Worth of ANNUITIES or PENSIONS, &c.

SECTION I.

When the ANNUITY, RATE, and TIME are given to find the PRESENT WORTH.

Rule, Square the Time, and multiply the Product by the Ratio; to this add twice the Time, then from this subtract the

the Time multiplied by the Ratio; and this is your Dividend; which divide by twice the Ratio multiplied by the Time, when 2 is added to the product. Lastly, multiply this Quotient by the Annuity, Pension, &c. and the Product is the Present Worth.

EXAMPLES.

1. What is the Present Worth of 100*l.* per Annum to continue 6 Years, at 5 per Cent? *Ans.* 519*l.* 4*s.* 7 $\frac{1}{4}$ *d.*
2. What is 40*l.* yearly Rent, to continue 12 Years, worth in ready Money, at 5 per Cent? *Ans.* 382*l.* 10*s.*
3. What is a Salary of 60*l.* per Annum, to continue 16 Years, worth in ready Money, at 4 per Cent? *Ans.* 760*l.* 19*s.* 6*d.*
4. What is an Annuity of 200*l.* per Annum, to continue 8 Years, worth in ready Money, at 5 per Cent? *Answer* 1342*l.* 17*s.* 1 $\frac{1}{2}$ *d.* 8.

Note, When the Annuity, Rent, &c. is paid half yearly, take $\frac{1}{2}$ the Ratio, $\frac{1}{2}$ the Annuity, &c. and twice the Number of Years; but if quarterly, take $\frac{1}{4}$ of the Ratio, $\frac{1}{4}$ of the yearly Rent, and four times the Number of Years, and proceed as before.

EXAMPLES.

1. What is the Present Worth of 100*l.* per Annum, payable half yearly, at 5 per Cent. and to continue 6 Years? *Ans.* 525*l.*
2. What is the Present Worth of 100*l.* per Annum, payable quarterly, at 5 per Cent. and to continue 6 Years? *Ans.* 527*l.* 17*s.* 8 $\frac{1}{4}$ *d.*

SECTION II.

When the PRESENT WORTH, the TIME and RATIO, are given to find the ANNUITY, RENT, &c.

Rule, Multiply the Ratio by the Time, and to the Product add Unity, and this is your Dividend; which divide by the Square of the Time multiplied by the Ratio, from which Sum subtract the Time multiplied by the Ratio; to this add twice the Time. Lastly, multiply the Quotient by twice the Present Worth, and the Product is the Annuity, &c.

EXAMPLES.

1. There is an Annuity of 6 Years to come, I demand the yearly Value, when the present Worth, at 5 per Cent. is 519*l.* 4*s.* 7 $\frac{1}{4}$ *d.* 5? *Ans.* 100*l.* per Annum.

2. I demand the yearly Rent of a House 12 Years to come, when the Present Worth at 5 per Cent. is 382l. 10s? *Answer* 40l. per Annum.

3. Suppose a Gentleman having a Salary 16 Years to come, at 4 per Cent. I demand the yearly Value, when the Present Worth is 760l. 19s. 6? *Answer* 60l. per Annum.

4. What is the yearly Value of an Estate 8 Years to come, allowing the Purchaser 5 per Cent. when the Present Worth amounts to 1342l. 17s. 1½d. 8? *Answer* 200l. per Annum.

Note, When the Payments are Half-yearly, you must take $\frac{1}{2}$ the Ratio, and multiply by 4 Times the Present Worth? and if quarterly you must take $\frac{1}{4}$ of the Ratio, and multiply by 8 Times the Present Worth, and proceed as before.

EXAMPLES.

1. There is an Annuity to continue 6 Years payable Half-yearly, I demand the Annuity when the present Worth at 5 per Cent. is 525l? *Answer* 100l.

2. There is an Annuity to continue 6 Years payable quarterly, I demand the Annuity, when the Present Worth at 5 per Cent. is 527l. 18s. 5½d. 152? *Answer*. 100l.

ANNUITIES, LEASES, &c. taken in Reversion.

SECTION I.

To find the PRESENT WORTH, thus:

Multiply the Square of the Time by the Ratio, and to the Product add twice the Time, from this subtract the Time multiplied by the Ratio, and this is the Dividend; which divide by twice the Product of the Time multiplied by the Ratio when 2 is added to the Product, and multiply this Quotient by the Annuity, Rent, &c. the Product is the Present Worth; which divide by the Time before it is to commence multiplied by the Ratio, when the Product is made more by Unity, and the Quotient will be the Answer to the Question.

EXAMPLES.

1. What is the Present Worth of 50l. per Annum, to continue 5 Years, but is not to commence till the end of two Years, allowing 5 per Cent. to the Purchaser? *Answer*. 200l.

2. Suppose one has the Promise of a Pension to continue 8 Years of 40l. per Annum, but is not to commence till the End of 4 Years, and he is willing to sell the same, allowing

5 *per Cent.* present Payment, what is the Worth? *Answer* 223*l.* 16*s.* 2*d.* ,23.

3. Suppose a Legacy of 400*l.* *per Annum*, to continue 12 Years is left to a Person of 17 Years of Age, the Time of Payment is to commence when he arrives at the Age of 21 Years; but he sells the same for present Money allowing the Purchaser 5 *per Cent.* what Sum was it worth? *Answer* 3187*l.* 10*s.*

4. A Person left a Relation an Annuity of 100*l.* *per Annum*, to continue 6 Years, but was not to commence till the End of 4 Years; but for present Money he sells the same and allows the Purchaser 6 *per Cent.* what was it sold for? *Answer.* 409*l.* 3*s.* 1½*d.*

SECTION II.

To find the yearly INCOME for an ANNUITY in REVERSION, having what it is sold for, the RATE of INTEREST, and the TIME it becomes due, and CONTINUANCE given.

Rule, First, Multiply what it sold for by the Ratio of the Interest, and that Product by the Time before it comes due, and to this add what it sold for and reverse the Sum.

Secondly, Multiply the Ratio by the Time it is to continue, and to the Product add Unity, which is a Dividend.

Thirdly, Multiply the Square of the Time of the Continuance by the Ratio, and to the Product add twice that Time, and from the Sum subtract the same Time multiplied by the Ratio, and the Remains is your Divisor.

Fourthly, The Quotient of this Division multiplied by twice the reserved Sum, the Product will be yearly, Annuity, &c. required.

EXAMPLES.

1. There is the Lease of an House taken for 5 Years, but commences not till the End of 2 Years, and it is sold for 200*l.* present Money, allowing 5 *per Cent.* to the Purchaser, what was the yearly Rent? *Answer.* 50*l.*

2. Suppose one has a Pension for 8 Years, but it will not commence till the End of 4 Years, and it is sold for the present Payment of 223*l.* 16*s.* 2*d.* ,232, allowing the Purchaser 5 *per Cent.* what was the yearly Pension? *Answer.* 40*l.*

3. A Person has an Annuity to continue 12 Years, but it will not commence till the End of 4 Years, and for present Money it is sold for 3187*l.* 10*s.* allowing the Purchaser 5 *per Cent.* what was the yearly Annuity? *Answer.* 400*l.*

4. A Person has an Annuity to continue 6 Years, but it will not commence till the End of 4 Years; but for present Money it is sold for 409*l.* 3*s.* 1¼*d.* allowing the Buyer 6 *per Cent.* what was the yearly Annuity? *Ans.* 100*l.*

EQUATION OF PAYMENTS.

RULE to find the true EQUATED TIME.

Divide each Payment by the Ratio multiplied by the Time, when Unity is added to the Product, and the Quotient is the Present Worth.

Then add all the Present Worths into one Sum and subtract it from the whole Debt, and divide the Remains by the Present Worth multiplied by the Ratio, and the Quotient is the true equated Time.

EXAMPLES.

1. A is indebted to B 1200*l.* to be paid in the following Manner, 200*l.* at the End of 3 Months, 400*l.* at the End of 6 Months, and the rest at the End of 9 Months; but they agree to have but one Payment, Rebate being made at 5 *per Cent.* the true equated Time is required? *Answer* 6,924 Months.

2. A merchant hath owing him 1000*l.* to be paid as follows, 300*l.* at the End of 2 Months, 300*l.* at the End of 6 Months, and the rest at the End of 10 Months; but he agrees to take the whole at 1 Payment, Rebate being made at 6 *per Cent.* the equated Time is required? *Ans.* 178 Days.

3. M is indebted to N 800*l.* to be paid as follows, 300*l.* at the End of 4 Months, 300*l.* at the End of 16 Months, and the rest at the End of 2 Years, or 24 Months; but they agree to have but 1 Payment of the whole, Rebate being made at 3 *per Cent.* the equated Time is required? *Answer*, 1 Year and 3 Days.

4. L owes M 1200*l.* to be paid as follows: 400*l.* down, 300*l.* at the End of 6 Months, and the rest at the End of 12 Months, or 1 Year; but they agree to have but one Payment of the whole, Rebate to be made at 9 *per Cent.* the equated Time of Payment is required? *Ans.* 166 Days.

COMPOUND INTEREST.

To find the Amount of 1 Pound for 1 Year at any Rate *per Cent.* as for Instance, at 5 and 6 *per Cent.* the Proportion will be in the following Manner:

As 100 : 105 :: 1 : 1,05 as 100 : 1035 :: 1 : 1,035
As 100 : 106 :: 1 : 1,06 as 100 : 104 :: 1 : 1,04

The following TABLES shew the Amounts of one Pound, at the Rate of $3\frac{1}{2}$, at 4, 5, and 6 per Cent. per Annum, from 1 Year to 30.

I. *The Table of the Amount of 1 l. at $3\frac{1}{2}$ and 4 per Cent.*

Years	$3\frac{1}{2}$ Rates	4	Years	$3\frac{1}{2}$ Rates	4
1	1,053	1,04	16	1,73397	1,87298
2	1,07122	1,0816	17	1,79466	1,94790
3	1,10871	1,12486	18	1,85747	2,02581
4	1,14752	1,16985	19	1,92248	2,10684
5	1,18768	1,21665	20	1,98977	2,19112
6	1,22925	1,26531	21	2,05941	2,27876
7	1,27227	1,31593	22	2,13149	2,36998
8	1,31681	1,36856	23	2,20610	2,46471
9	1,36289	1,42331	24	2,28331	2,56330
10	1,41059	1,48024	25	2,36323	2,66583
11	1,45996	1,53945	26	2,44594	2,77246
12	1,51106	1,60103	27	2,53155	2,88336
13	1,56395	1,66507	28	2,62015	3,09870
14	1,61068	1,73167	29	2,71186	3,11865
15	1,67533	1,80094	30	2,80677	3,24339

II. *The Table of the Amount of 1 l. at 5 and 6 per Cent.*

Years	5 Rates	6	Years	5 Rates	6
1	1,05	1,06	16	2,18287	2,54053
2	1,1025	1,1236	17	2,29201	2,69277
3	1,15762	1,19101	18	2,40661	2,85433
4	1,21550	1,26247	19	2,52695	3,02559
5	1,27628	1,33822	20	2,65329	3,20713
6	1,34009	1,41851	21	2,78596	3,39956
7	1,40710	1,50363	22	2,92526	3,60353
8	1,47745	1,59384	23	3,07152	3,81974
9	1,55132	1,68947	24	3,22509	4,04893
10	1,62889	1,79084	25	3,38635	4,29187
11	1,71033	1,89829	26	3,55567	4,54938
12	1,79585	2,01219	27	3,73345	4,82234
13	1,88564	2,13292	28	3,92012	5,11168
14	1,97993	2,26090	29	4,11613	5,41838
15	2,07892	2,39655	30	4,32194	5,74349

SECTION I.

When the Principal, the Rate of Interest, and Time, are given to find the Amount.

Rule, Multiply the Amount of one Pound at the given Rate *per Cent.* so many Times continually into itself as are the given Number of Years less one, and then multiply the given Principal, and the Result of this Multiplication is the Answer to your Question.

EXAMPLES.

1. What Sum will 350*l.* amount to at 6 *per cent.* in 5 Years? *Ans.* 468*l.* 7*s.* 6 $\frac{3}{4}$ *d.*
2. What will 272*l.* amount to in 6 Years at 5 *per cent.* *per annum?* *ans.* 364*l.* 10*s.* 1*d.*
3. What is the Amount of 1000*l.* in 6 Years at 6 *per cent.* *per annum?* *ans.* 1418*l.* 10*s.* 3.
4. What is the Amount of 670*l.* at 4 *per cent.* *per annum* for 4 Years? *ans.* 783*l.* 16*s.*

SECTION II.

When the AMOUNT, RATE, and TIME are given to find the PRINCIPAL.

Rule, Divide the Amount, by the Amount of one Pound for the given Time, and the Quotient is the Principal.

EXAMPLES.

1. What Principal must be put to Interest 5 Years at 6 *per cent.* to amount to 468*l.* 7*s.* 6 $\frac{3}{4}$ *d.*? *ans.* 350*l.*
2. What Principal will amount to 364*l.* 10*s.* 1*d.* in 6 Years, at 5 *per cent.* *per annum?* *ans.* 272*l.*
3. What Principal will amount to 2418*l.* 10*s.* 3 in 6 Years, at 6 *per cent.* *per annum?* *ans.* 1000*l.*
4. What Principal will amount to 783*l.* 16*s.* in 4 Years at 4 *per cent.* *per annum?* *ans.* 670*l.*

SECTION III.

When the PRINCIPAL, the RATE, and AMOUNT are given to find the TIME.

Rule, Divide the Amount by the Principal, and that Quotient divide by the Amount of 1 Pound for 1 Year continually, till nothing remains, the Number of them Divisions will be the Time.

EXAMPLES.

1. In what Time will 350*l.* amount to 468*l.* 7*s.* 6 $\frac{3}{4}$ *d.* at 6 *per cent.* *per annum?* *ans.* 5 Years.

2. In what time will 272*l.* amount to 364*l.* 10*s.* 1*d.* at 5 per cent. per annum? *answ.* 6 Years.
3. In what Time will 1000*l.* amount to 1418*l.* 10*s.* ,3 at 6 per cent. per annum? *answ.* 6 Years.
4. In what Time will 670*l.* amount to 783*l.* 16*s.* at 4 per cent. per annum? *answ.* 4 Years.

SECTION IV.

When the PRINCIPAL, AMOUNT and TIME are given to find the RATE per cent.

Rule, Divide the Amount by the Principal, and the Quotient is the Amount of one Pound for the given Time, then extract such Root as the Time denotes, and that Root is the Amount of one Pound for one Year, from which take Unity, and the Remains will be the Ratio per cent. which discovers the Rate.

EXAMPLES.

1. At what Rate per cent. will 350*l.* amount to 468*l.* 7*s.* 6 $\frac{1}{2}$ *d.* in 5 Years? *Answer* 6 per cent.
2. At what Rate per cent. will 272*l.* amount to 364*l.* 10*s.* 1*d.* in 6 Years? *Answer* 5 per cent.
3. At what Rate per cent. will 1000*l.* amount to 1418*l.* 10*s.* ,3 in 6 Years? *answ.* 6 per cent.
4. At what Rate per cent. will 670*l.* amount to 783*l.* 16*s.* in 4 Years? *answ.* 4 per cent.

Of ANNUITIES or PENSIONS in ARREARS.

SECTION I.

When the Annuity or Pension are given, and the Time it continues, and the Rate per cent. to find the Amount.

Rule, Multiply continually the Amount of one Pound for one Year, into itself so many Times as the Number of Years less by one; and this Product multiply by the Annuity, and from this subtract the Annuity, and divide the Remains by the Ratio less one, and the Quotient is the Amount.

EXAMPLES.

1. What will an Annuity of 40*l.* per annum, payable yearly, amount to at 5 per cent. in 3 Years? *answ.* 126*l.* 2*s.*
2. What will an Annuity of 200*l.* per annum, payable Yearly, amount to in 4 Years, at 5 per cent? *answ.* 862*l.* 6*s.* 6*d.*

3. If the yearly Rent of a House which is 70*l.* per annum be forborn 6 Years at 4 per cent. what is the Amount? *answer* 464*l.* 6*s.* 1 $\frac{3}{4}$ *d.*

4. If a Salary of 100*l.* per annum, be omitted 5 Years at 5 per cent. payable yearly, what is the Amount? *answer* 552*l.* 11*s.* 3.

SECTION II.

When the AMOUNT, the RATE per cent. and the TIME are given to find the ANNUITY, PENSION, &c.

Rule, Multiply the Amount of one Pound for 1 Year by the whole Amount, from which subtract the whole Amount, and divide the Remains by the Amount of one Pound for one Year, multiplied continually into itself, as many Times as the given Numbers of Years less one, and from the Product subtract Unity, the Quotient will be the Annuity, &c.

EXAMPLES.

1. What Annuity being forborn 3 Years, will amount to 126*l.* 2*s.* at 5 per cent? *Answer*, 40*l.* per annum.

2. What Annuity being forborn 4 Years, will amount to 862*l.* 0*s.* 6*d.* at 5 per cent? *Answer*, 200*l.* per annum.

3. If the yearly Rent of an House being forborn 6 Years, at 4 per cent. amount to 464*l.* 6*s.* 1 $\frac{3}{4}$ *d.* what was the Rent? *Answer*, 70*l.* per annum.

4. If the Payment of a Salary be omitted 5 Years, at 5 per cent. amount to 552*l.* 11*s.* 3 what was the Salary? *Answer*, 100*l.* per annum.

Of the present Worth of ANNUITIES, PENSIONS, &c.

SECTION I.

When the Annuity, Pension, &c, Rate and Time are given, to find the present Worth.

Rule. Divide the Annuity, Pension, &c. by the Amount of one Pound for one Year, multiplied continually by itself, so many Times as are the given Number of Years less one, and subtract the Quotient from the Annuity; then divide the Remains by the Ratio less one, and the Quotient is the present worth.

EXAMPLES.

1. What is the Present Worth of 30*l.* per annum to continue 4 Years at 5 per cent? *Answer*. 106,37*l.*

2. What is the Present Worth of a Pension of 60*l.* per annum,

annum, to continue 5 Years, at 5 *per cent*? *Ans*w. 259,767*l*.

3. What is the Present Worth of a Lease of an House for 4 Years to come, of 100*l*. *per annum* at 4 *per cent*? *Ans*w. 363,6*l*.

4. What is the Present Worth of an Annuity of 90*l*. *per annum*, to continue 5 Years, 4 *per cent*. being allowed for Present Payment? *Ans*w. 400,664*l*.

Note. If you subtract the Present Worth from the Product of the Annuity, Rent, &c. multiplied by the Number of Years, the Remains may be called the Discount.

SECTION II.

When the PRESENT WORTH, TIME and RATE are given to find the ANNUITY, RENT, &c.

Rule. Multiply the Amount of 1*l*. for one Year continually into itself as many Times as are the Number of Years, and that Product again by the Present Worth.

Then multiply the Amount of one Pound for one Year continually into itself as many Times as are the Number of Years less by one, and that again by the Present Worth; and subtract this from the former Product, and divide the Remains by the Amount of one Pound for one Year, multiplied continually into itself as many Times as the Number of Years less by one, when Unity is subtracted from the Product; and the Quotient will be the Annuity Rent, &c.

EXAMPLES.

1. What Annuity to continue 4 Years, may be bought for 106,378*l*. at 5 *per cent*? *Ans*w. 30*l*.

2. What Annuity or Pension, to continue 5 Years, may be bought for 259,767*l*. at 5 *per cent*? *Ans*w. 60*l*.

3. What Pension or Annuity, to continue 4 Years, may be bought for 363,6*l*. at 4 *per cent*. *Ans*w. 100*l*.

4. What Annuity or Rent, to continue 5 Years, may be bought for 400,664*l*. at 4 *per cent*? *Ans*w. 90*l*.

Of ANNUITIES, LEASES, &c. taken in REVERSION.

SECTION I.

Rule. First find the Present Worth of the yearly Sum at the given Rate and Time of its Continuance, thus multiply the Amount for one Year continually into itself as many Times as Number of Years continuance less by one, by this divide the Annuity, Rent, &c. the Quotient subtract

tract from the Annuity, &c. and divide the Remains by the Ratio less one, and the Quotient will be the present Worth.

Then divide the present Worth so found, by the Amount of one Pound for one Year, multiplied continually into itself so many Times as are the Number to come before the Annuity, &c. commences less by one, and the Quotient is the Answer to your Question.

EXAMPLES.

1. What is the Present Worth of the Reversion of a Lease of 50*l.* *per Annum* to continue for 5 Years, not to commence till the end of 3 Years, allowing 5 *per Cent.* for present Payment? *Ans.* 187,003*56l.*

2. Suppose a Person had a Lease of certain Lands of 76*l.* *per Annum*, which he has got to continue 5 Years, and has a mind to renew the Lease for 6 Years, to begin when the old one ends; what is the present Worth of the said Lease in Reversion, allowing him 5 *per Cent.* for present Payment? *Ans.* 494*l.* 15*s.* 11½*d.*

3. One having a Lease of 180*l.* *per Annum*, of which 3 Years are yet to come, is desirous to renew the Lease for 5 Years, to commence when the old one expires; how much must he pay down for the same, allowing him 5 *per Cent.* for present Payment? *Ans.* 1004*l.* 18*s.* 6*d.*

SECTION II.

Given the Value of the ANNUITY and REVERSION, the TIME before it commences, and the TIME it is to continue, with the RATE of INTEREST to find the ANNUITY, RENT, &c.
Rule, Make use of the Time before it commences.

Thus multiply the Amount of one Pound for one Year continually into itself, as many Times as are the Number less by one, and that Product by the Value of the Annuity, and this last will be the present Worth.

Now make use of the Time it continues, thus, multiply the Amount of one Pound for one Year continually into itself, as many Times as are the Number of Years, and this last multiply by the present Worth, and reserve the Product; then multiply the Amount of one Pound for one Year continually into itself, as many Times as are the Number of Years less by one, and this by the present Worth; and this Product subtract from the reserved Product, and the Remains divide by the Amount of one Pound

Pound for one Year, multiplied into itself, as many Times as are the Number of Years less by one, when Unity is subtracted from it, and the Quotient will be the yearly Annuity, Rent, &c.

E X A M P L E S.

1. What Annuity or yearly Rent to be entered upon 3 Years hence, and then to continue 5 Years, may be bought for 187,00356*l.* ready Money at 5 per Cent? *Ans.* 50*l.*

2. Suppose a Lease of certain Lands, which has yet to continue 5 Years; but the Leaser bought the same in Reversion for 6 Years, to commence when the old Lease expired, and paid down for the same 494*l.* 15*s.* 11½*d.*, what was the yearly Rent of the said Lands when he was to be allowed 5 per Cent. for so doing? *Ans.* 76*l.* per Annum.

3. One paid down for a Lease 1004*l.* 18*s.* 6*d.* for 5 Years, which was to commence at the End of 3 Years, how much was the yearly Rent when for the said present Payment he was allowed 5 per Cent? *Ans.* 180*l.* per Annum.

Of Purchasing FREEHOLD ESTATES;

That is, such as are to continue for ever.

S E C T I O N I.

When the YEARLY RENT and RATE OF INTEREST are given to find the PRESENT WORTH.

Rule. Divide the yearly Rent by the Ratio (of the Interest) less one, and the Quotient is the Value of the Estate.

E X A M P L E S.

1. An Estate of 70*l.* per Annum is to be sold, what is it worth, allowing the Buyer 5 per Cent. for his Money? *Ans.* 1400*l.*

2. How much is the Value of an Estate of 762*l.* per Annum, allowing the Buyer 4 per Cent. for his Money? *Ans.* 19050*l.*

S E C T I O N II.

If the VALUE of the ESTATE and RATE are given to find the YEARLY RENT.

Rule. Multiply the Value of the Estate by the Ratio of the Interest less one, and the Product is the yearly Rent.

E X A M P L E S.

1. An Estate is bought for 1400 Pounds, and the Buyer is allowed

allowed 5 *per Cent.* what is the yearly Rent? *Ans.* 70*l.* a year.

2. If an Estate is bought for 19050*l.* and the Buyer is allowed 4 *per Cent.* what is the yearly Rent? *Ans.* 762*l.*

Of REBATE or DISCOUNT.

SECTION I.

To find the PRESENT WORTH.

Rule. Multiply the Amount of one Pound for one Year continually into itself, as many Times as are the Number of Years less by one, and the Product is the Divisor, then divide the Sum to be discounted by it, and the Quotient is the present Worth.

EXAMPLES.

1. What is the present Worth of 284*l.* 10*s.* 6*d.* payable 3 Years hence at 5 *per Cent*? *Ans.* 245,694*l.*

2. Suppose a Debt of 694*l.* 17*s.* 6½*d.* payable 3 Years hence; but it is agreed to be paid in present Money, allowing the Rebate at 4 *per cent.* what Sum must the Creditor receive? *answer* 617,7*l.*

3. If 286*l.* Pounds be payable in 4 Years, what is the Present Worth at 5 *per cent.* Discount? *answer* 235,29.

SECTION II.

When the DEBT is required.

Rule. Multiply the Amount of one Pound for 1 Year, as many Times as are the Number of Years less by one, and this Product multiply by the Present Worth, the Result will be the Answer.

EXAMPLES.

1. If 245,694*l.* be received for a Debt payable 3 Years hence, Allowance of 5 *per Cent.* was made to the Debtor for present Payment, what was the Debt? *Ans.* 284*l.* 10*s.* 6*d.*

2. The Sum of 617,7*l.* was paid for a Debt, and 4 *per Cent.* was allowed for present Payment, it not being due till the End of 3 Years, what was the Debt? *Answer* 694*l.* 17*s.* 6½*d.*

3. If 235,29*l.* satisfy a Debt that was not due till the End of 4 Years, and the Debtor was allowed 5 *per Cent.* for present Payment, what was the Debt? *Ans.* 286*l.*

PRAC-

PRACTICAL QUESTIONS.

1. **A** Gentleman going to *Bath*, orders his Steward to discharge the following Bills; to the Wine-Merchant 120*l.* 16*s.* 9*d.* to the Baker 50*l.* 7*s.* 10*d.* to the Brewer 79*l.* 7*s.* 6*d.* to the Coal-Merchant 62*l.* 5*s.* to the Butcher 99*l.* 17*s.* 9*d.* to the Taylor 42*l.* 15*s.* 5*d.* to the Cornchandler 107*l.* 19*s.* 9*d.* and proposes to take with him 500*l.* how much Money must he draw of his Banker? *Answer* 1063*l.* 10*s.*

2. A Gentleman, at his Death, left an Estate worth 459*l.* 10*s.* 11½*d.* he bequeaths to his Sister 105*l.* to 4 near Relations 150*l.* each, 140*l.* to charitable Uses, and 200*l.* to pay his Funeral Expences, the rest to his Executor; I desire to know his Share? *Answer* 2600*l.* 10*s.* 11½*d.*

3. A says to B, I have twice three and twenty Crowns, B says to A, and I have twice twenty three Crowns; which had the most and how many? *Answer*. B had 20 Crowns more than A.

4. A sent his good Friend B fourscore and eleven Guineas at one Time, 120 Guineas at another Time; B pays him 100*l.* at one Time, and 100*l.* 11*s.* at one Month after; I demand what remains due to A? *Answer*. 21*l.*

5. What is the Value of 1000 Bars of Iron whose total Weight is 27000*lb.* at 15*s.* the 100*lb.*? *Answer*. 202*l.* 10*s.*

6. Bought 1½*Hb.* of Wine for 17*l.* 10*s.* 5¼*d.* what will 2*Hbs.* of the same cost? *Answer* 23*l.* 7*s.* 3*d.*

7. How long will a Person be in saving 1000*l.* if he saves Half a Guinea per Week? *Answer*. 36*y.* 32*w.* 5*d.*

8. If 6½ Yards of Cloth cost 2*l.* 14*s.* 2*d.* what cost 764¾ Yards? *Answer*. 318*l.* 12*s.* 11*d.*

9. If 1 Yard of Cloth cost 3*s.* 9*d.* what will 975¾ Ells *English* cost? *Answer*. 228*l.* 13*s.* 1½*d.*

10. If I buy a Hundred Weight of Cheefe for 1*l.* 9*s.* 5*d.* how much did I pay for 17*lb.* at that Rate? *Answer* 4*s.* 5½*d.*

11. I bought a Puncheon of Rum for 38*l.* 10*s.* to which I was minded to put as much Water as would reduce the prime Cost to 7*s.* 4*d.* per Gallon; the Question is What Quantity of Water must that be? *Answer*. 21 Gallons.

12. If a Ship sails 96 Miles in 24 Hours, how many Miles will she sail in 7 Days with the like Wind? *answer* 672 Miles.

13. If a Man earns $3l. 3s.$ per Week, how much may he spend per Day to have $100l.$ together at the Year's End?

Ans. $3s. 6d.$

14. A Person said he had five Sons, and every one 3 Years older than his next younger Brother; his eldest Son was born when he was 21 Years old, which is now the Age of his youngest. I desire to know the Father's Age?

Ans. 54 Years.

15. If 12 Inches in Breadth and 12 in Length make a superficial Foot, how much must there go in Length to make a Foot when the Breadth is but 3 Inches? *Ans.* 48 Inches.

16. How long will $1000l.$ last me if I spend no more or less than $3s. 6d.$ per Day? *Ans.* 15 Years, 8 Months, and 2 Weeks.

17. A Cistern which would be filled in 12 Minutes time by two Pipes both running into it, in 20 Minutes it would be filled by one alone; I desire to know in what Time it would be filled by the other? *Ans.* 30.

18. A Farmer let 7 Acres of Wheat to reap at $4s. 2d.$ per Acre, also 40 Acres of Barley to mow at $2s. 9d.$ per Acre, and 10 Acres of Oats to mow at $2s. 5d.$ each; there were 5 Reapers and 4 Mowers. I desire to know how much each Man had to receive? *Ans.* The Reapers $5s. 10d.$ each, the Mowers $1l. 13s. 6\frac{1}{2}d.$ each.

19. A Miller mixed three Sorts of Flour together; 7 Bushels at $6s.$ per Bushel, 9 at $5s.$ per Bushel, 11 at $4s. 6d.$ per Bushel; I demand what one Peck of this Mixture is worth? *Ans.* $1s. 3\frac{1}{8}d.$

20. Admit the Rent of a House to be $30l.$ per annum, and the King's Tax $4s.$ in the Pound, what must the Landlord pay in Proportion to the Rent where they are taxed under this limitation of $\frac{3}{5}$ in the Pound? *Ans.* $3l. 12s.$

21. If 12 Bricklayers, in 30 Days, build a Wall 2 Feet broad and 100 Feet long, in how many Days will 20 Bricklayers build a Wall 3 Feet broad and 1000 Feet long? *Ans.* 270 Days.

22. Two Farmers, A and B, carried 72 hund. 9 qrs. 8 lb. of Cheese to Sterbridge Fair, which they sold for $109l. 19s. 7d.$ the Difference of their Weights was 2 hund. 7 qrs. 14 lb. and of their Money $5l. 17s. 6d.$ I demand each Man's Weight of Goods, and how much each received?

ceived? *Ans.* A 57*l.* 18*s.* 6½*d.* 39 hund. 0 qrs. 11*lb.*
 B 52*l.* 1*s.* 0½*d.* 35 hund. 0 qrs. 25*lb.*

23. A grocer bought sugar at 9½*d.* per pound; what is the value of 12 hund. 1 qr. 17 *lb.* gross, tare 9 pounds per 112 *lb.* at that rate? *Ans.* 50*l.* 11*s.* 0*d.*

24. In 176 hund. 1 qr. 10 *lb.* of tobacco gross, tare 13 *lb.* per 112 *lb.* tret 4 *lb.* per 104 *lb.* how much neat weight? *Ans.* 149 C. 3 qrs. 15 *lb.*

25. A merchant bought 4; C. 1 qr. 19 *lb.* of cloves gross, tare 19 *lb.* per 112 *lb.* tret 4 *lb.* per 104 *lb.* how much neat weight had the merchant to pay for, and what money did the cloves cost at 2*s.* 9¼*d.* per *lb.*? *Ans.* weight, 36 C. 1 qr. 3 *lb.* neat. Money, 562*l.* 17*s.* 10¼*d.*

26. A farmer had 245 acres of land, which he had a mind to divide amongst his three sons; he desired that A might have 44 more than B, and C 31 less than B. I desire to know how many acres each son must have? *Ans.* A 121⅓, B 77⅓, C 46⅓.

27. If 89*l.* 11*s.* be paid by the insurers for a ship, at 3½ per cent. I demand how much is insured on her? *Ans.* 2558*l.* 11*s.* 5d¼.

28. If at 2¼*l.* per cent. my factor's commission comes to 36*l.* 11*s.* 9*d.* I demand what I have dealt for through his order? *Ans.* 1626*l.* 2*s.* 2½*d.* ⅔.

29. My walking stick is 45¼ inches long, and gives a shadow 49½ inches; I likewise measured the shadow of a tree, and found it to be 249 feet 6 inches. I demand the height of the tree? *Ans.* 228 feet.

30. A farmer sold 7 Quarters of barley for 5*l.* 15*s.* by which he gained 20 per cent. What was his gain per cent. by selling the same quantity at 7*l.* 5*s.* *Ans.* 31*l.* 6*s.* 1⅓*d.*

31. Suppose I lent my friend 27*l.* 7*s.* on the 20th of February 1760, to pay it me again the 20th of May following, and he desires me to use as much of his money for 20 weeks as will recompence the favour; what must that sum be? *Ans.* 17*l.* 11*s.* 7½*d.* ⅙.

32. A gentleman having a court yard to pave with bricks of 6 inches long and 3 broad, which he found would be 480; but altering his mind, he would have it paved with bricks of 9 inches long and 4 broad; how many will compleat the work? *Ans.* 240.

33. A person received 78*l.* 7*s.* 6*d.* for the principal and interest of a certain sum of money at the rate of 6 per cent. per

per annum for 9 months, what sum of money was out?
Ans. 75*l*.

34. A grocer bought 9 C. 3 qrs. 10 lb. of cloves gross, tare 12 lb. *per* 112 lb. tret 4 lb. *per* 104 lb. which cost when neat 2*s*. 9*d*. *per* lb. and sold them again for 159*l*. 17*s*. I desire to know how much he gained by the whole?
Ans. 29*l*. 12*s*. 9*d*.

35. Suppose a family, consisting of 20 people, drink out 27*l*. 17*s*. 6*d*. worth of beer in 2 years when it is 8*s*. *per* barrel, how many, after the same rate of drinking, will drink out 49*l*. 11*s*. worth in 11 weeks? *Ans.* 335 men.

36. A person begun the world with a certain sum of money, which he improved by trade annually a fifth part, excepting 80*l*. expended for the use of his family; the same he continues every year, except 80*l*. *per annum*, as before, and at the end of 5 years found that his estate amounted to 1768*l*. 11*s*. 7*d*. I desire to know his first stock? *Ans.* 848*l*. 9*s*. 1½*d*.

37. In some parishes they have a rule to assess the inhabitants $\frac{3}{5}$ of their rent; now suppose the poors rate to be 8½*d*. in the pound for a house that pays 2*l*. 19*s*. 11½*d*. *per annum*, I desire to know the yearly rent of that house?
Ans. 52*l*. 6*s*. 6½*d*.

38. Paid for the carriage of 4 C. 2 qrs. 12 lb. 200 miles, 2*l*. 18*s*. 6*d*. how much must I pay for the carriage of 6 C. 1 qr. 14 lb. after the same rate 86 miles? *Ans.* 1*l*. 14*s*. 9½*d*. $\frac{3}{5}$.

39. A merchant bought 7½ C of pepper, and 5¼ C of ginger; the pepper cost him 14*l*. 19*s*. 7*d*. *per* Cwt. the ginger 12*l*. 17*s*. 6*d*. *per* Cwt. what is the whole value, and how much must it be sold out *per* ounce to gain 10*l*. by each sort? *Ans.* the pepper 2*d*. the ginger 1¼*d*. the whole value 186*l*. 7*s*. 6*d*.

40. What length of a board that is 2½ inches thick, and 7¼ inches broad, is equal to a solid foot? *Ans.* 89 inches $\frac{29}{135}$.

41. A gentleman having three relations, left 500*l*. to be divided amongst them; to A he gave 79*l*. more than B, and to B he gave 45*l*. less than C. I desire to know each man's share. *Ans.* A 204*l*. 6*s*. 8*d*. B 125*l*. 6*s*. 8*d*. C 170*l*. 6*s*. 8*d*.

42. A grocer in trade had in stock 578*l*. 19*s*. 6*d*. in book debts 109*l*. 9*s*. 8*d*. he owed 97*l*. 15*s*. 7*d*. the ex-
 O 2 pences

pences of his family 57*l.* 12*s.* 6*d.* yearly ; he cleared the first year 73*l.* 14*s.* 5*d.* what was his neat ballance at the year's end ? *Answ.* 606*l.* 15*s.* 6*d.*

43. A merchant bought 49 chests of prunes, each weighing neat 3 C. 2 qrs. 11*lb.* for 399*l.* how must he sell them *per* pound to gain 50*l.* 9*s.* 11½*d.* by them ? *Answ.* 5¼*d.* $\frac{63}{97}$.

44. A farmer making up his accounts at the year's end, found that his neat stock amounted to 789*l.* 19*s.* 11½*d.* he owing his landlord half a year's rent, which was 74*l.* 16*s.* the land-tax and some small repairs to be deducted, 15*l.* 11*s.* 9*d.* when he had settled his accounts he found himself worth 1329*l.* 11*s.* 9*d.* I desire to know how much he had in ready money ? *Answ.* 480*l.* 7*s.* 6½*d.*

45. One begun the world with a certain sum of money, which he improved so well by trade, that in 21 years, at an average, he had cleared 305*l.* *per annum* ; making his will, he left 6000*l.* to his widow, to his two sons 1000*l.* each, and 800*l.* to his daughter, and 60*l.* for his funeral expences. I demand his first stock ? *Answ.* 2455*l.*

46. Suppose a higler buys 60*l.* worth of eggs at 2 for a penny, and sells them again at 5 for two-pence, and buys 30*l.* worth more at 3 a penny, and sells them out at 6 for two-pence ; queré what he gained or lost by trading ? *Answ.* 12*l.* lost.

47. Laid out 275*l.* 10*s.* 10*d.* in wine at 3*s.* 7*d.* *per* gallon, which having received damage in carriage, sold what remained good at 7*s.* 6*d.* *per* gallon, and found my returns no more than 209*l.* 5*s.* 6*d.* I demand what quantity was damaged ? *Answ.* 979 gallons.

48. A merchant found that his gain amounted to 40*s.* *per* day ; how much may he spend *per* week to lay up 300*l.* at the year's end ? *Answ.* 8*l.* 5*s.* 4¼*d.*

49. Three merchants trading in company, A gains 32*l.* in 7 months, B 42*l.* in 9 months, and C 54*l.* in 10 months, with a stock of 108*l.* 15*s.* I desire to know A and B's stock separately. *Answ.* A's stock 45*l.* 2*s.* 2½*d.* $\frac{2}{3}$. B's stock 76*l.* 2*s.* 6*d.*

50. A gentleman having a rectangular park, in which he has a mind to plant 1512 oaks 30 feet asunder in 18 rows ; I desire to know the length of this park. *Answ.* 840 yards.

51. A merchant from *Holland* delivered at *London* 430*l.* sterling to receive 659*l.* *Flemish* at *Amsterdam*; what was 1*l.* sterling valued at in *Flemish* money? *Ans.* 1*l.* 10*s.* 7½*d.*

52. A merchant was possessed of a $\frac{2}{3}$ share of a ship, and sold $\frac{2}{3}$ of his part for 2560*l.* what was the value of the whole ship? *Ans.* 6400*l.*

53. What is the value of 18 pieces of holland, each piece containing $39\frac{1}{8}$ ells *Flemish*, when it is sold at 5*s.* the ell *English*? *Ans.* 106*l.* 19*s.*

54. Two travellers set out from *London* to *Plymouth*, distant 180 miles; the first travels 17 miles *per* day; three days after, the other follows him, and travels $23\frac{1}{2}$ miles *per* day. How many miles will they have to go when the latter overtakes the former? *Ans.* $35\frac{7}{8}$ miles.

55. A gentleman having 771 guineas left in his family to distribute among his servants which he divided into 3 classes; to the first he gave $\frac{1}{2}$, to the second $\frac{1}{3}$, and to the third $\frac{1}{4}$; the sum was parted equitably among them; I desire to know each class's share? The 1st 373*l.* 12*s.* 9*d.*, 2 the 2d 249*l.* 1*s.* 10*d.*, 15, the 3d 186*l.* 16*s.* 4*d.*, 6.

56. Bought 19 bales of silk, each bale 15 pieces, and each piece 142 Yards, and paid 3*l.* 5*s.* 7*d.* for 18 Yards; I demand the price of the whole at that rate, and what it stood me in *per* yard? *Ans.* the whole 7372*l.* 13*s.* 2¼*d.*, $\frac{3}{5}$; one yard 3*s.* 7½*d.*, $\frac{8}{9}$.

57. Two travellers, A and B, meeting together at an inn, reckon up the number of miles each had travelled, and found their sum to be 92, and the difference 38; quere the number of miles each had travelled? *Ans.* A 65 and B 27.

58. A certain man had $\frac{1}{3}$ part of a wood, and gave $\frac{2}{3}$ of his part to his son; I demand how much the son's part is worth, the whole wood being valued at 1719*l.*? *Ans.* 229*l.* 4*s.*, $\frac{3}{4}$.

59. One bought a horse and sold him again for 45 guineas, and by so doing he lost 9 *per cent.* but considering his keeping and other expences, he ought to have gained 19 *per cent.* how much may he be said to be sold for less than his just value? *Ans.* 14*l.* 10*s.* 7*d.*

60. Sold 399 tons of iron for 1449*l.* whereby I gained $2\frac{7}{8}$ *per cent.* I require what the said iron cost me *per* ton, considering $12\frac{1}{2}$ *per cent.* to be a reasonable profit; likewise what

what I may be said to have lost by this sale? *Ans.* 4*l.* 11*s.* 1*d.* $\frac{8\frac{3}{4}}{3}$ per ton, and 139*l.* 9*s.* 3*d.* $\frac{3\frac{3}{4}}{4}$ lost.

61. A young lady having an estate left her of 80*l.* per annum, she being but 9 years of age her trustees put out the money, both principal and interest yearly as it became due at 5 per cent. till she attained to the age of 21 years; I desire to know this lady's fortune? *Ans.* 1273*l.* 7*s.* 4 $\frac{1}{4}$ *d.*

62. A tenant being indebted to his landlord agreed to pay him at 9 several payments to be made in Arithmetical Progression, the first payment to be 10*l.* 12*s.* and the last to be 40 guineas; I desire to know the whole debt, and what each payment is to be? *Ans.* the debt 236*l.* 14*s.* the second payment 14*l.* 10*s.* 6*d.* the third 18*l.* 9*s.*

63. Divide 75*l.* 17*s.* 6*d.* amongst 5 men, give A $\frac{3\frac{3}{4}}{3\frac{1}{2}}$, B $\frac{3}{4}$, C $\frac{7}{3\frac{1}{2}}$, D $\frac{1}{8}$, E $\frac{3}{8}$, what is each man's share? *Ans.* A 7*l.* 2*s.* 3 $\frac{1}{2}$ *d.* B 14*l.* 4*s.* 6 $\frac{1}{4}$ *d.* C 16*l.* 11*s.* 11 $\frac{1}{4}$ *d.* D 9*l.* 9*s.* 8 $\frac{1}{4}$ *d.* E 28*l.* 9*s.* 0 $\frac{3}{4}$ *d.*

64. Suppose a man can walk from London to Edinburgh (450 miles distant) in 18 days, when the days are 17 hours long, how many Danish miles (19 of which make 70 English miles) can he travel in 3 months, when the days are 17*h.* 49*m.* long? *Ans.* 597 $\frac{1}{3}$ miles.

65. There are two cities distant from each other 187 miles, from which two persons, A and B, set out from each city at the same time to meet one another, one travelling at the rate of 5 miles in 2 hours, the other at the rate of 7 miles in 4 hours; I desire to know how long a time, and how far, when they met, each had travelled? *Ans.* A 110 miles, B 77 miles, and 44 hours each.

66. B had $\frac{1}{3}$ part of a ship, and sold $\frac{3}{8}$ of his part to C, and C sold $\frac{2}{5}$ of his part to D; I demand the value of D's part, the whole ship being valued at 999? *Ans.* 49*l.* 19*s.* value of D's part.

67. If 7*lb.* of mace be worth 6*lb.* of tea, and 12*lb.* of tea worth 10*lb.* of coffee, and 20*lb.* of coffee worth 50*lb.* of sugar, and 80*lb.* of sugar worth 9*lb.* of cloves, and 12*lb.* of cloves worth 100*lb.* of ginger, and 20*lb.* of ginger worth 15*lb.* of pepper at 9*l.* 8*s.* 6*d.* per Cwt. I desire to know the value of 1*lb.* of mace? *Ans.* 2*s.* 1*d.*

68. Suppose the distance from York to Hull be 52 miles by water, and two vessels set out at the same time from each place to proceed to the other, each being able in a
calm

calm to go 6 miles an hour, that from Hull is assisted by the tide $3\frac{1}{2}$ miles an hour, and the other retarded $2\frac{1}{2}$ miles in the same time, how far distant from each place will they meet? *Ans.w.* from Hull 38 miles, and from York 14 miles.

69. Being minded to purchase the reversion of a lease of 500*l.* *per annum* for 18 years to come, but doth not commence till the end of 3 years; how much money must be paid down, allowing 6 *per cent.* compound interest? *Ans.w.* 4545*l.* 11*s.* 2*d.*

70. A grocer agreed with a carrier for 1 ton and 3 quarters of goods 9 miles wanting $\frac{3}{8}$, for $\frac{2}{3}$ of 36*s.*; what must he pay *per hundred* for 5 miles and $\frac{3}{5}$ in the same proportion? *Ans.w.* 5*l.* 4*d.* $\frac{1491}{4025}$.

71. Suppose a landlord lives far from his tenant, yet judging his tenant honest and able to pay him, is content to forbear his rent 14 years, upon condition his tenant will allow him 6 *per cent.* compound interest for the forbearance, the rent being 33 *per annum*; now the question is what must the landlord receive at the end of 14 years? *Ans.w.* 693*l.* 10*s.*

72. What is a lease of 25*l.* *per annum*, to continue 21 years, worth in present money discount or rebate 6 *per cent.* compound interest being allowed to the purchaser? *Ans.w.* 294*l.* 2*s.* 7*d.*

73. There is a lease of a house, or land, worth 12*l.* *per annum*, and there are 16 years of the lease yet to come, which lease a man would buy if he could lay out his money so as to gain 10 *per cent.* I desire to know what the lease is worth? *Ans.w.* 129*l.* $\frac{3}{13}$.

74. There is an annuity of 200*l.* *per annum* forborn 6 years, how much is due at the end of the said time, allowing simple interest at the rate of 6 *per cent.*? *Ans.w.* 1380*l.*

75. What present money will satisfy a debt of 240*l.* due at the end of 4 years yet to come, discount or rebate being allowed at the rate of 5 *per cent.* *per annum*, *Ans.w.* 200*l.*

76. A gentleman's yearly income being 3767,75*l.* his weekly expences amount to 31,75*l.* land-tax, repairs, &c. amount to $\frac{1}{8}$ of his whole estate; the charitable donations that he distributes, amount to ,0625 of the remainder and his daily pocket expences to 1,125*l.* the question is to require what his whole expences amount to in 1 year, and the difference betwixt them and his estate? *Ans.w.* expended 2635*l.*

2635*l.* 9*s.* 1*d.*, 152; the difference 1132*l.* 5*s.* 10 $\frac{2}{3}$ *d.*, 392.

77. I desire to know the difference between the rebate of 650*l.* for 9 years, and the interest of the same at 4 *per cent.* *Ans.* 61*l.* 18*s.* 10*d.*

78. A gentleman bequeathed to one of children $\frac{1}{10}$ of his estate, and to the other $\frac{8}{10}$, but when it came to be divided, one received 209*l.* more than the other; I demand the value of the whole estate? *Ans.* 1323*l.* 13*s.* 4*d.*

79. A man goes with a certain number of sheep to market where he fold half of them, and half a sheep more; and thus he goes on to two other markets, where he fold half the remainder, and half a sheep more, they being now reduced to 10, I desire to know how many he had at first? *Ans.* 87 sheep.

80. A general being minded to place 2400 men in battalia, so as there may be 60 in rank and 40 in file, and they are all to stand in order, that is to say, 3 feet distant in rank and as much in file, how many square feet of ground will they occupy and what is the side of that square? *Ans.* 20709 square feet they will occupy, 143.9 square feet side of the square.

81. A merchant sells a certain number of oranges and lemons, for 137*l.* 10*s.* the oranges were valued at 1*s.* *per* dozen, and the lemons at 2*s.* *per* dozen; now suppose the number of lemons to be 5 times the number of oranges; how many dozen of oranges and lemons were there in all? *Ans.* 250 dozen of oranges, 1250 dozen of lemons.

82. If a bullet of brass of 8 inches diameter weighs 72*lb.* what shall a bullet of brass weigh whose diameter is 4 inches? *Ans.* 9*lb.*

83. Three men, A, B, and C, bought a hogshead of wine, which cost them 40*l.* and they agreed to pay for it in the following manner; that A shall pay $\frac{1}{2}$, B $\frac{1}{3}$, and C $\frac{1}{6}$, what part of the said 40*l.* must each man pay, and what quantity of wine must each man have in proportion to what he paid? *£. s. d.*

Ans. A must pay 18 9 2 $\frac{3}{4}$, $\frac{1}{13}$ A must have 29 0 0 $\frac{8}{13}$
 B must pay 12 6 1 $\frac{2}{3}$, $\frac{5}{13}$ B must have 19 1 1 $\frac{11}{13}$
 C must pay 9 4 7 $\frac{1}{4}$, $\frac{7}{13}$ C must have 11 2 0 $\frac{4}{13}$

84. A merchant bought 18 pipes of Madeira wine for 250*l.* and sold them again for 320*l.* payable at the end of 9 months, rebate being made at 5 *per cent.* what was the neat gain in ready money? *Ans.* 67*l.* 9*s.* 4 $\frac{3}{4}$ *d.*

85. A gentleman having 13*l.* 15*s.* to distribute in the workhouse among the poor, to every boy he gave 12*d.* to every woman 18*d.* and to every man 2*s.* there were for every man 2 women, and for every woman 2 boys; I demand the number of each? *Ans.* 25 men, 50 women, and 150 boys.

86. If $\frac{1}{4}$ *lb.* of gunpowder be sufficient to charge a gun, whose concave diameter is $1\frac{1}{2}$ inch, how much gunpowder will suffice to charge a gun whose concave diameter is 7 inches? *Ans.* 76,2*lb.*

87. A bricklayer charges 7*l.* a rod for work that stood him in 5*l.* 16*s.* how must the carpenter charge for a floor 33 feet 5 inches by 24 feet 5 inches, that stood him in 1*l.* 17*s.* per square to keep the same proportion with the bricklayer? *Ans.* 18*l.* 6*s.* 6*d.* $\frac{5}{8}$.

88. Two builders, A and B, gained 211*l.* by a house, with which they agreed to buy a chariot and a pair of horses, and to use them in proportion to what each of them had disbursed; which when sealed A was to have it 17 days to B's 12. I desire to know what each man ventured, since their profits were computed at 20 per cent? *Ans.* A 618*l.* 8*s.* 11*½d.* $\frac{1}{2}$ $\frac{8}{9}$. B 436*l.* 11*s.* 0*¼d.* $\frac{1}{2}$ $\frac{8}{9}$.

89. A draper bought 7 packs of cloth, every pack had 5 parcels in it, and each parcel 9 pieces, and every piece 27 yards; he gave after the rate of 3*l.* 12*s.* for every 5 yards. I demand the price of the 7 packs, and what the cloth cost per yard? *Ans.* the 7 packs cost 6123*l.* 12*s.* one yard 14*s.* 4*d.* $\frac{3}{4}$.

90. A, B and C, trading together, gained 2000*l.* which is to be divided according to each man's stock, viz. as often as A put in 15*l.* B put in 27*l.* and C 30*l.* what is each man's share of the gain? *Ans.* A 416*l.* 13*s.* 4*d.* B 750*l.* C 833*l.* 6*s.* 8*d.*

91. A gentleman bequeathed 100*l.* to the parish towards the relief of the poor children; to 20 girls 2*s.* 4*d.* per week each, and 30 boys at 3*½d.* per day each. I desire to know how long this sum will maintain them? *Ans.* 18 weeks and 3 days.

92. Admit the cathedral church of St. Paul to have 10 canons and 20 vicars, and their expences yearly to be 3000*l.* suppose every canon to have four times as much as a vicar, how much is each man's income? *Ans.* the canons 200*l.* each, the vicars 50*l.* each.

93. A gentleman bought a house for 1000 guineas, and sold it again, after he had laid out 50*l.* in repairs, 1600*l.* what did he make *per cent.* on his money, considering it was done and ended in 211 day's time; and likewise what he gained *per annum*? *Ans.* 82*l.* 7*s.* 5*d.* *per annum.*

94. What is the exchange and charges on the four following bills, at $4\frac{1}{8}\%$ *per cent.* and what did they fall short of 2000*l.* that is, 2160 milreas, at 6 $\frac{3}{8}\%$ each; 129 florins, at 4*s.* 11 $\frac{1}{2}$ *d.* each; 1300 *Venice* ducats, at 4*s.* 9*d.* each; and 1000 *French* crowns, at 4*s.* 6*d.* each? *Ans.* The exchange 1254*l.* 4*s.* 7 $\frac{1}{2}$ *d.* The charges 51*l.* 14*s.* 8 $\frac{3}{4}$ *d.* They fall short 694*l.* 4*s.* 8*d.*

95. A gentleman spends half his estate in household expences, $\frac{1}{12}$ in servants wages, liveries, &c. $\frac{1}{6}$ in horses, hounds, coaches, and other expences; and saves the remainder to purchase with, which was 1800*l.* What was his whole estate? *Ans.* 7200*l.* *per annum.*

96. Suppose a person borrowed 1429*l.* 6*s.* 8*d.* which he kept 9 $\frac{1}{2}$ years, and then returned for principal and interest 2212*l.* 11*s.* 6*d.* At what rate *per cent.* *per annum* did he pay, allowing simple interest? *Ans.* 5*l.* 15*s.* 4*d.*

97. A young gentleman arriving at the age of 21, was told by his guardians, that his fortune consisted in cash to the amount of 26416*l.* and that his father had been dead 12 years, and the sum he left I have allowed you 5 *per cent.* for since that time, only I have deducted 100*l.* *per annum* for your education. What sum was left the son by the father, only simple interest? *Ans.* 16510*l.*

98. Suppose a merchant bought 144 pieces of cloth, each piece containing 32 $\frac{5}{8}$ yards, at 15*s.* 9*d.* *per* yard, which he sent to *Spain*, to receive from thence *Canary* wine, and paid for several charges in shipping his goods 104*l.* 15*s.* 6*d.* How many pipes of *Canary* at 38*l.* 18*s.* 8*d.* *per* pipe, must be delivered for the broad cloth to gain 500 marks? *Ans.* 106 pipes, and 35 gallons.

99. Suppose A has $\frac{2}{3}$ of a wood, B $\frac{2}{7}$, and C the remainder, and A and B buys C's part equally between them; I demand what part of the wood A must have, and what part B will have after they have bought C's part; also how much money C must have; the whole wood being valued at $\frac{5}{8}$ of 999 $\frac{5}{8}$ *l.* *Ans.* A's part of the wood $\frac{39}{70}$, B's part $\frac{31}{70}$, C must have 196*l.* 7*s.*

100. If a rope whose weight is 14 C $\frac{3}{4}$. be 18 $\frac{1}{4}$ inches cir-

circumference, I demand the weight of another rope that is $9\frac{1}{4}$ inches circumference? *Ans.* 5, 9 Cwt.

101. If a rope is 9,69 inches in circumference, I demand the circumference of another rope that is $11\frac{1}{2}$ times its strength? *Ans.* 32,86 inches.

102. A merry young gentleman had a fortune left him by an old aunt, $\frac{2}{5}$ of which he squandered away in 5 months, $\frac{5}{7}$ of the remainder held him 19 months longer, by which time he began to look into his affairs, and found he had but 429*l.* left. I desire to know how much his aunt left him? *Ans.* 1930*l.* 10*s.*

103. A merchant bought 69 pieces of tammies, each piece containing $69\frac{5}{8}$ yards, that cost him at the first 459*l.* 15*s.* which pieces he sent to the dyers, and paid for charges 13*s.* 9*d.* per piece, and each piece shrunk of its length in dying $3\frac{5}{8}$ yards; what did one yard of tammy stand him in after dying? *Ans.* 2*s.* $2\frac{1}{2}$ *d.* $\frac{2}{22}$.

104. Two merchants having a mind to purchase a ship, valued at 1400*l.* says A to B, if you will give me $\frac{4}{5}$ of your money, I can pay for the ship alone; says B to A, if you will give me $\frac{6}{7}$ of your money, I can pay for it; how much money had each? *Ans.* A 675*l.* 17*s.* $2\frac{3}{4}$ *d.* $\frac{1}{2}$ *s.* B. 724*l.* 2*s.* 9*d.* $\frac{1}{2}$ *s.*

105. There is a piece of land of 20 perches square, worth 30*l.* there is another piece of land of the same goodness, worth 67*l.* 10*s.* how many perches square ought that to be? *Ans.* 30 perches.

106. Some merry companions spent at a reckoning 12*l.* 3*s.* and every man paid as many ninepences as there were men in company. I demand the number of Men? *Ans.* 18 men.

107. A ship being 132 Feet 9 inches in the hold, 42 feet broad, and 7 feet 8 inches deep, I demand how many bales of goods may be stowed therein, each bale 4 feet 4 inches long, and 3 feet 3 inches broad, and 3 feet 6 inches deep, leaving 3 feet 10 inches for a gangway the whole length? *Ans.* 788 $\frac{5}{8}$ bales.

108. If a ship of 100 tons be 44 feet long at the keel, of what length shall the keel of a ship be of 220 tons? *Answer,* 57,225 feet.

109. Laid out in lots of muslin, 1440*l.* 12*s.* but upon overlooking the same, $\frac{2}{7}$ of it was damaged, so that I was obliged to sell it at 7*s.* per yard, and by so doing I lost

171*l.* 10*s.* how much *per ell* must I sell the remainder for to make up the said loss? *Answer*, 17*s.* 6*d.* *per ell*.

110. A gentleman making his will, bequeathed his estate, which amounted to 7000*l.* in the following manner, to be divided amongst his six sons; A $\frac{1}{2}$, B $\frac{1}{3}$, C $\frac{1}{4}$, D $\frac{1}{5}$, E $\frac{1}{6}$, F $\frac{1}{7}$, and desires of his executor that his will may be punctually executed according to his intention; I desire to know each man's share? *Answer*, A 2107*l.* 6*s.* 2*d.* B 1464*l.* 17*s.* 5*d.* C 1098*l.* 13*s.* 1*d.*; D 878*l.* 18*s.* 5*d.* E 737*l.* 8*s.* 8*d.* F 627*l.* 16*s.* 0*d.*

111. A general having an army of a certain number of men, is determined to divide them into 12 divisions in the following manner, *viz.* the first is to contain two thirds of the whole number, the second two thirds of them which were left, and so on to the twelfth and last division, when he found he had one man left: the question is to find the number of men at first? *Answer*, 531441.

112. A gentleman took a lease of a house for 72 years, and being asked how much of the time was expired, he made this answer, that $\frac{3}{4}$ of the time past was equal to $\frac{7}{9}$ of the time to come; I demand the time past and the time to come? *Answer*, the time past 35 $\frac{7}{20}$ years; the time to come 36 $\frac{3}{5}$ years.

113. By my accounts from *Leghorn*, my factor has acquainted me, he has disposed of my goods in the following manner, *viz.* 150 pieces of *Irish* cloth, each 26 yards, at 5 livres *per* yard; 150 dozen pair of shoes at 8 livres *per* pair; 49 C 1 qr. 17 lb. of cheese at 15 sols *per* lb. the charges upon the said goods amounted to 150*l.* sterling: I ordered my factor to make my returns as follows, *viz.* $\frac{1}{3}$ in wine, at 34*l.* *per* pipe; $\frac{2}{3}$ in allum, at 11 12*s.* 9*d.* *per* Cwt. the rest in pieces of $\frac{8}{9}$, exchange at 4*s.* 8*d.* *per* piece; what number and quantity am I to receive of each, allowing my factor 2 $\frac{3}{4}$ % *per cent.* on the return of the said goods? *Answer*. In wine 13,604 pipes, in allum 344,63 Cwt. pieces of $\frac{8}{9}$ 1585,88.

114. A person making his will bequeathed his estate in the following manner; *Imprimis*, He gave to his eldest son $\frac{2}{5}$ of $\frac{3}{7}$, and $\frac{2}{3}$ of his estate to his eldest daughter; he gave $\frac{1}{3}$ of $\frac{2}{5}$ and $\frac{1}{9}$ of his estate. When the eldest son and daughter's fortunes came to be paid, the son received 109*l.* more than the daughter. I desire to know what was the whole estate, and what part was left for his wife and younger

younger children? *Ans.* the whole estate 1348*l.* 10*s.* 1*d.* the eldest son 438*l.* 12*s.* 8½*d.* the eldest daughter 329*l.* 12*s.* 8*d.* the wife and younger children 580*l.* 4*s.* 8½*d.*

116. Divide 540*l.* among 3 men, give B 64*l.* more than A, and C 84*l.* more than B; I desire to know each man's part? *Ans.* A 109*l.* 6*s.* 8*d.* B 173*l.* 6*s.* 8*d.* and C 257*l.* 6*s.* 8*d.*

117. A son asked his father how old he was; he answered thus; If you take $\frac{9}{11}$ of my age from $\frac{3}{7}$ of your's the difference of our ages would be 29. I desire to know the father's age? *Ans.* 74 years, 5 months, and $\frac{1}{5}$.

118. A gentleman having the care of an orphan's estate worth 1250*l.* 16*s.* which he kept in his hands 9 years and then paid both principal and interest 1642*l.* 12*s.* at what rate *per cent.* did he allow interest for the same? *Ans.* 3*l.* 9*s.* 7¼*d.* $\frac{2}{5}$.

119. Admit a ship of 500 tons to be 75 feet by the keel, 34 feet in breadth at the beam, and 30 feet deep in the hold. I demand the length at the keel, the breadth at the beam, and depth in the hold of another ship that is to be 784 tons? *Ans.* the length at the keel 87,1 feet, the breadth at the beam 39,4 feet, the depth in the hold 34,8 feet.

120. Two merchants, A and B, made a joint stock, A put in 315*l.* more than B, A's stock continued in company 7½ months, B put in a certain sum unknown, and it continued 10¼ months; after a certain time they divided the gain equally. I desire to know each merchant's stock? *Ans.* A 1075*l.* B 750*l.*

121. A certain usurer received 36 dollars for the simple interest of 186*l.* for a certain time unknown; also, he received 90 dollars for the gain of 360*l.* at the same rate of interest, for a certain time unknown; now the sum of the months in which both the said number of Dollars were gained, was 20. The question is to know in what time the 36 dollars were gained. *Ans.* 8½ months.

BILLS OF PARCELS.

Mrs. JOHNSON,

Nov. 17, 1760, Bought of Isabella Tradefair and Co.

		s.	d.
17	Pair of Stockings, at	5	5 per pr. £.
25	Silk handkerchiefs, at	4	9 each.
23	Pair of thread stockings, at	4	3 per pr.
16	Pair of strawberry hose, at	3	10
22	Pair of <i>Norwich</i> hose, at	5	2
15	Pair of silk gloves, at	5	3
Total		£ 28	2 4

Received, at the same time, the contents in full, for
self and company,

Jonathan Tradefair.

Madam ROBINSON,

Bought of Robert Shuter, Oct. 15, 1760.

		s.	d.
23	Ells of Dowlas, at	1	5 per ell. £.
15	Ells of Holland, at	3	9½
22	Ells of diaper, at	1	3
18	Damask napkins, at	2	9 each.
17	Yards of damask, at	4	6 per yd.
15	Yards of Muslin, at	6	9
		£ 17	4 2½

Madam WHITE,

Bought of Moses Chinaman, Aug. 5, 1760.

		s.	d.
5	Dozen of glasses, at	0	7½ ea. £.
24	China dishes, at	9	8
3	Dozen of enamelled plates, at	3	3
4	Dozen of china plates, at	2	3
5	Pair of large jarrs, at	3	4
A tea-table-set, compleat		£ 2	19 0
		£ 28	10 2½
		<i>The</i>	

The Reverend Mr. HARROW,
Bought of *Adam Stockholm*, June 11, 1760.

	l.	s.	d.	
3 Fine Turbot, at ———	0	7	6	each £.
107 Dried Salmon, at ———	0	1	3 $\frac{3}{4}$	
Sturgeon, five Kegs, at ———	0	14	9	
2 $\frac{1}{4}$ Hundred of Ling, at —	7	8	9	per H.
Herrings, 7 Barrels, at ———	4	7	10	each
3 $\frac{1}{2}$ Hundred of Stockfish, at —	3	17	3	per H.
	£. 72 12 1 $\frac{1}{2}$			

The Honourable the Lady GOODISON,
Bought of *William Henry*, October 20, 1760.

	s.	d.	
2 Hundred of Golden Pippins, at	2	9	per H. £.
2 $\frac{3}{4}$ Hundred of Windsor Pears, at	2	7	
12 Ropes of Onions, at ———	1	3 $\frac{1}{2}$	each
9 Dozen of Lemons, at ———	2	9	per Doz.
12 $\frac{1}{2}$ Dozen of <i>Lisbon</i> Ditto, at —	1	3	
25 Do. of Seville and China Ora. at	3	11 $\frac{3}{4}$	
	£. 8 7 5 $\frac{1}{4}$		

Sir GEORGE NEWHAM, Bart.
Bought of *James Finchley*, Aug. 5, 1760.

	s.	d.	
20 Ells of Muffin, at ———	9	2	per Ell £.
19 Yards of Long Lawn, at —	5	0	per Yd
17 Yards of <i>Irish</i> Cloth, at ———	1	9	
18 Yards of Flowered Cotton, at	4	6	
20 Yards of Bag Holland, at —	5	6	
30 Yards of Dowlas, at ———	1	6	
	£. 27 4 1		

The Right Honourable the Countess of OXFORD.
Bought of *John Mercer*, December, 5, 1760.

	s.	d.	
14 $\frac{1}{2}$ Yards of flowered Silk, at	15	9	per Yd. £.
18 Yards of Silk Poplin, at ———	12	7	
13 $\frac{1}{2}$ Yards of Sattin, at ———	8	10	
17 $\frac{1}{4}$ Yards of <i>Genoa</i> Velvet, at —	16	5	
19 $\frac{1}{2}$ Yards of <i>Manchester</i> Ditto, at	15	5	
15 Yards of Lustring, at ———	5	7	
	£. 62 1 8 $\frac{1}{4}$		

160 *Bills of Parcels.*

ACCOMPTANT'S

Mr. *E BENEZER SHEPHERD,*Bought of *Aaron Leather,* July 5, 1760.

	s.	d.
Oil'd Bucks Skins 24, at ———	13	5 each £.
Oil'd Ram Skins 152, at ———	3	9
Oil'd Lamb Skins 290, at ———	1	2½
Sheep Skins dressed in Allum 180, at 1	1	¼
Goat Skins, 98, at ———	0	10¾
Calves Skins 23, at ———	3	9½

 £ 80 16 2
Mr. *TITUS WILKINSON,*Bought of *Timothy Oilman,* February 23, 1760.

	s.	d.
A fine <i>Westphalia</i> Ham, Wt. 25 lb. at 0	9½	per lb. £.
Galls. of pickled Mushrooms, at 2	11	per Qt.
30½ Pound of Bay Salt, at ———	0	5½ per lb.
39¾ Pound of Capers, at ———	1	1¾
19½ Pound of Anchovies, at ———	0	11¾
20½ Pound of Salt Petre, at ———	0	10¾

 £ 7 17 6¾
The Right Honourable the Lord *CHESTER.*Bought of *Samuel Fareham,* March 6th, 1760.

	s.	d.
Half a Cwt. of Sugar, at ———	0	6 per lb. £.
6 Sugar Loaves, Wt. 44¾ lb. at 1	1	
3 Pound of Cloves, at ———	7	2
1 Barrel of Figs, Wt. 1 Cwt. & 17 lb. at 0	6	
3 Frails of <i>Malaga</i> Raisins, wt. 70 lb. at 0	4¼	
¼ of a Butt of Cur. wt. 2 C. 1 qrs. 17 lb 0	3¾	

 £ 13 14 3
Mr. *CHARLES GAMSAY.*Bought of *Michael Draper,* Aug. 1, 1760.

	s.	d.
18 Yards of Broad Cloth, at ———	17	6 per Yd. £.
17 Yards of <i>Yorkshire</i> Cloth, at 7	9	
12½ Yards of Black Cloth, at ———	15	8½
28½ Yards of Shalloon, at ———	1	9
20¾ Yards of Serge, at ———	5	10
15½ Yards of Superfine Scarlet, at 18	6	

 £ 55 0 9½

Mr.

COMPANION.

Bills of Parcels. 161.

Mr. SAMUEL HEARTY, and Partner,
Bought of David Shadwell and Co.

	<i>l.</i>	<i>s.</i>	<i>d.</i>	
Raisins, wt. 23 C. 1 qr. 17lb. at	1	19	6	per C. £.
Pepper, wt. 3 C. 3 qrs. 7lb. at	1	17	4	
Sugar, wt. 74 C. 2 qrs. 26lb at	2	2	0	
Bees Wax, wt. 12 C. 1 qr. 13lb. at	3	1	2	
Currants, wt. 49 C. 2 qrs. 15lb. at	1	15	4	
14lb of Cloves, at	0	1	2	per Oz.
Figs, wt. 33 C. 1 qr. 3lb. at	2	7	6	per C.

£ 427 17 6

Mr. NATHAN BRONSTON,
Bought of Henry Beater, Jan. 20, 1760.

	<i>s.</i>	<i>d.</i>	
A Copper, wt. 89lb. at	1	2½	per lb. £.
Ironwork to Ditto, wt. 43lb. at	0	2½	
A Fireshovel, Tongs, Poker, wt. 23lb. at	0	4¾	
A Stove Grate, wt. 39½lb. at	0	3¾	
3 Brads Saucepans, wt. 31lb. at	1	5¾	
A large Iron Pot, and a small one, wt. 49lb. at	1	3¾	

£ 12 5 2½

Mr. STEPHEN GOODMAN,
Bought of Isaac Moreton, Nov. 15, 1760.

	<i>l.</i>	<i>s.</i>	<i>d.</i>	
8 Score of Hertfordshire Eggs, at	0	0	0¾	each £.
Bacon, wt. 2 C. 1 qr. 12lb. at	1	0	9	per C.
Hogs Lard, wt. 1 C. 0 q. 19lb. at	0	0	2½	per lb.
Suffolk Butter, 5 Weys, at	8	4	2	each.
Gloucester Ch. 15, wt. 7 C. 1 qr. 3lb. at	1	19	6	per C.
Warw. do. 71, wt. 9 C. 3 qrs. 21lb. at	1	3	1	

£ 71 3 9½

Mr. JOSEPH BAGSHAW,
Bought of Jacob Merchant, May 15, 1760.

	<i>l.</i>	<i>s.</i>	<i>d.</i>	
Tobacco wt. 28 C. 2 qrs. 17lb. at	4	17	9	per C. £.
Figs 7 Cwt. qr. 19lb. at	1	7	5	
Currants wt. 74 C. 0 qrs. 13lb. at	2	1	7	
Sugar wt. 55 C. 0 q. 7lb. at	1	17	9	
Raisins wt 65 C. 2 qrs. 27lb. at	1	19	4	
Ginger 3 Hhds. wt. 2 C. 1 q. 9lb. at	3	7	2	

£ 545 6 11½

162 *Bills of Parcels.*

ACCOMPTANT'S

*The Hon. Mrs. DRINKWATER,*Bought of *Catharine Hofier*, May 1, 1760.

	s.	d.	
5½ Dozen of Cotton Muffatees, at	0	4½	per Pair £.
19¼ Yards of black Ribband, at	—	0	5¼ per Yd.
2½ Doz. Pair of Kid Gloves, at	—	1 11	per Pair
5½ Pair of Thread Stockings, at	4	5	
35 Yards of Ferret, at	—	0	2½ per Yd.
			£ 16 7 8½

*Mr. FREDERICK HAL L.*Bought of *Richard Stationer*, Aug. 5, 1760.

	s.	d.	
2 Quires of the best marble Paper, at	0	1½	per Sht. £.
43 Sticks of the best Sealing Wax, at	0	4¾	per Stick.
132 Quires of Tea Crown Paper, at	0	4	per Quire.
2 Reams of <i>French Demy</i> , at	—	2 4	
4 Reams of <i>French Royal</i> , at	—	1 6	
3 Dozen of Memorandum Books, at	0	6	each.
			£ 14 6 4½

*Mess. GRANT and HARLEY,*Bought of *Luke Turner and Partner*, September 16, 1760.

	s.	d.	
A Tod of carded Wool, wt. 28lb. at	2	8	per lb. £.
A Sack of Wool, wt. 364lb. at	—	1 8	
1; 1 Pound of black Wool, at	—	3 1¼	
1 Dozen of Pound Mops, at	—	0 9	each.
1½ Dozen of long Hair Brooms, at	0	10½	
34¼ Foot of Matting, at	—	1 0½	per Yd.
			£ 61 19 4¾

*Mess. JONES and CARTER,*Bought of *Crofs and Gilbert*, Partners, May 3, 1760.

	s.	d.	
5 Bags of Spanish Tobacco, Nt. 593lb.¾ at	0	5¼	per lb. £.
1 Box of Virginia d°. Nt. 1C. 3qrs 23lb. at	1	3¼	
1 Hhd. of Oroonoko d°. Nt. 3C. 1 qr.			
and 18lb. at	—	1 5	
1 Box of Turpentine Chips, Nt. 53½lb. at	0	2½	
1 Lot of Scotch Snuff, Nt. 4C. 1q. 15lb. at	0	11¼	
½ Lot of Havanah d°. Nt. 3C. 3qrs. 17lb. at	1	7½	
1 d°. Strasburgh, Nt. 2C. 1qr. 15lb. at	1	2¼	
			£ 129 7 0

BILLS

COMPANION.

Bills on Book Debts. 163

BILLS ON BOOK-DEBTS.

The Honourable Mrs. C A S T O R, Dr.
1760. To *Josiah Gilroy.*

l. s. d.

July 31.	For a Mahogany Chest of Drawers, compleat	—	—	—	£. 18 11 6
Aug. 3.	1 Doz. of Maho. Chs. at	o	6	10	ea.
15.	A Feather Bed and Bol.	—	—	—	3 0 0
19	Four Pair of Blankets, at	o	18	0	ea.
30.	4 quilted Coverlids, at	1	9	0	
Total					<u>£ 35 1 6</u>

If a Servant receives the Bill, let the Receipt run thus ;
Received September 4, 1760, the Contents in full, for my
Master Josiah Gilroy.

35l. 1s. 6d

per Abraham Whitehead.

Her Grace the Dutcbess of Argyle, Dr.
To *Ferdinando Ranger.*

1760

		l.	s.	d.	
Jan. 15.	For 73 Gals. of Claret W. at	1	1	8	<i>per G. £.</i>
18.	43 D°. of Mountain, at	o	6	7	
Feb. 5.	57 D°. of Port red, at	o	7	10	
	12 D°. of Burgundy, at	1	16	0	
	19 D°. of Champaign, at	1	7	0	
	27 D°. of Madeira, at	—	7	4	
	29 D°. of White Lisbon, at	o	6	5	
					<u>£ 181 5 10</u>

The Right Hon. PIERCY Earl of Northumberland, Dr.

To *Peter Arundel and Partner, 1760.*

Aug. 10.	For a new Post Chariot	—	71l. 11s. 6d.	
13.	20 Yds. of green Cloth	} 1 2 pr Yd.		
	for the Lining at			
28.	To 300 Brass Nails at	4 6 pr. bd.		
	15 Yds. of brown Serge	} 8 6 pr. yd.		
	for the Box			
30.	31 Yds. of Laced Ferret at	o 6 1/4		
	To 1 Pair of Harness compleat			

12 0 0
£ 92 11 11 1/4
Sir

Sir *NICHOLAS BACON*, Dr.To *George Manwell*, for Work and Materials in his House
1760 at *St. Mary-le-Bone*. £.

July 17. For 30 Hundred of Lime at ol. 17s. 3d. *pr Hd.*
 27. 40 Thousand of Bricks at 1 0 0 *pr. Tb.*
 29. Work for 13 Men 17 Days, at 0 3 6 *pr. Day.*
 Aug. 4. D°. for 13 Labourers D°. at 0 2 1 —
 15. 11 Thousand 10 Inch Tiles at 0 0 3½ *each*
 26. 20 Load of Sand at — — 0 2 6¼ *per Ld.*

 £290 11 0
CHRISTOPHER HENSEY, Esq; Dr.1760 To *Abraham Cronsey*, s. d.

Dec. 6. For Oats 10 Quarters at — 1 10 *per Bsh. £*
 12. Barley 15 Qrs. at — 2 8 —
 14. Beans 12 Qrs. at — 3 9 —
 18. Peas 9 Qrs. at — 3 5 —
 20. Hops 28 Pounds at — 3 10 *per lb.*
 30. Malt 10 Qrs. at — 1 3 *per Bush.*

 £64 0 0
Mr. PAUL DANDRIDGE, Dr.To *Jonathan Carpenter* and Partner, s. d.

Sept. 4. 1760. For 21 Feet of Fir Timber at 0 3½ *pr f. £.*
 11. 13 Whole Deals at — 1 9 *each*
 17. 15 Slit Deals at — 0 10½ —
 19. 26 Hundred of Nails at — 0 6 *per Hd.*
 Oct. 2. 17 Hundred of Nails at — 0 10 —
 15. 26 Days Work at 2 6 *per Day.*

 £6 14 2
Mr. BENJAMIN DAVIES, Dr.To *Simon Matthewson*, Dyer,For Dying the following Goods, delivered *per order*, to
1760. *Giles Penn*, Packer. s. d.

May 12. Yellow Stuffs 50 Ps. at — 13 9 *per piece*
 Aug. 6. Blue D°. 80 at — 12 3 —
 Nov. 23 Black D°. 20 at — x 11 9 —
 29 White D°. 70 at — 8 10 —
 Dec. 24. Orange D°. 40 at — 14 7 —
 30. Green D°. 29 at — 8 8 —

 £167 15 6

The

The Right Hon. the Marquis of Caralar, Dr.

1760.	To Philip Harrington,	s.	d.	
Apr. 6.	For a Doz. of matted Chs at 17	9	ea.	£
17	A Pair of Indian Cabinets			33 19 6
28	Two Chimney Glasses	2	15 9 each.	
May 17	Four Sconces at	0	4 10	—
29	Two Pair of Glasses at	5	7 6 per pr.	
31.	Three d ^o . of Chinese } Curtains at —	3	15 3	
				£73 4 1

The Hon. Mr. SHAKESPEAR, Dr.

1760	To Andrew Stoneland,	s.	d.	£.
May 10	For 120 Feet of Pavement, Purbeck St. at 0	7	per F.	
June 5.	3 Pieces of Curb, each 5 Feet at	1	6	
12.	Marble Chimney Ps. 7 Ft. by 2 Ft 4 Is. at 5	0	—	
15.	One Portland Slab 6 Ft by 3 Ft. 6 Is. at 1	7	—	
29.	The paving of a Yard with Purbeck Stone 24 Ft 5 Is. by 17 Ft 6 Is } at	2	9	—
				£69 2 5

His Grace the Duke of Hamilton, Dr.

1760.	To Hugh Hopkinson,	d.		
Aug. 10.	For 14 Stone and a half of Beef at	5 ½	per lb.	£.
11.	A Leg of Mutton wt. 15 lb at	5	—	
12.	A Quarter of Lamb, wt. 17 lb. at	6 ¼	—	
	5 lb. and a half of Sewit at	6	—	
28.	2 Shoulders of Veal, wt. 32 lb. at	6 ½	—	
30.	3 Fillets of D ^o . wt. 4 Stone at	6 ¼	—	
31.	2 Breasts of Mutton wt. 18 lb. at	3 ¾	—	
				£5 10 7 ¾

The Honourable the Lady HARLEY, Dr.

1764	To Abel Cooper,	oz.	dwt.	s.	d.	£.
Aug. 8.	For a Silver Coffee-pot wt. 28	14	at 6	3	per oz.	
	a waiter for D ^o .	4	13	at 6	2	
Oct. 16	A Pair of Salts with Spoons	3	16	at 5	10	
30.	A chased Cream Jug	3	7	at 7	4	
	5 Cruet Tops	2	9	at 5	8	
Dec. 5.	A Dozen of Spoons	38	11	at 5	9	
						£24 10 2 ½

Madam.

166 *Bills on Book Debts.*

ACCOMPTANT'S

Madam GREEN, Dr.

1760	To Elizabeth Holwell,	s.	d.
Feb. 6	For 14 $\frac{5}{8}$ Yards of Bombazine at	—	4 9 per Yd. £.
Aug. 8,	12 $\frac{1}{3}$ D°. of Lustring at	—	5 9
	18 $\frac{1}{4}$ D°. of Perfian at	—	3 2
	13 $\frac{7}{8}$ D°. of Brocade at	—	10 6
Oct. 19.	11 $\frac{3}{4}$ D°. of Sattin at	—	8 9
	17 $\frac{3}{8}$ D°. of Damask at	—	9 6
£30 10 6 $\frac{1}{2}$			

Mr. LABAN KIBROTH, Dr.

1761	To Daniel Garmite,	s.	d.
Oct. 15.	For Brass Door Locks 12 at	7	11 ea. £.
	17. Bolts wt. 1C. 1qr. 19lb. at	0	3 $\frac{1}{4}$ per lb.
	19. Spring Door Locks 17 at	3	9 each
	22. A large Iron stove wt. 1C. 2qr. 15lb. at	13	9 per Cwt.
	28. An Iron Back—1C. 1qr. 11lb. at	11	9 $\frac{1}{2}$
	31. Hinges 52 Pair 2C. 1 qr. 15lb. at	11	7 3
£15 52 $\frac{1}{2}$			

The Honourable Madam Rowe, Dr.

1760.	To Mess. Corbet and Barrafs,	d.
Sep. 12.	For 10 Dozen lb. of long Sixes at	— 7 $\frac{1}{2}$ per lb. £.
	19. 14 D°. of Tens at	— 7 $\frac{1}{2}$
Oct. 5.	9 D°. of short Sixes at	— 7 $\frac{3}{4}$
	12. 6 D°. of mould Candles at	12s. 4 per dz.
	19. 8 D°. Rush Lights at	6 3
	23. Hard Soap wt. 3C. 1qr. 15lb. at	0 6 $\frac{3}{4}$ per lb.
		£29 3 5 $\frac{1}{4}$

Mr. JOSHUA ASHTON and Partner, Dr.

1760	To Augustus Kingstone,	l.	s.	d.
May 7.	9 Barrels of Figs wt. 7C 3qr. 17lb. at	1	7	3 p.C. £.
	15. 5 Hhds. of Sugar 47C. 1qr. 11 lb. at	1	15	7
	20. 4 $\frac{1}{2}$ Butts of Currants 79C. 0q. 6lb. at	1	18	4
June 5.	12 Barrels of Raisins 52C. 0q. 9lb. at	1	13	9
	19. 7 Barrels of Ginger 42C. 0q. 11lb. at	1	19	7
	30. 7 Hhds. of Tobacco 22C. 1q. 12lb. at	4	18	0
£527 4 11 $\frac{1}{2}$				
Mr.				

Mr. MARK ORLAND, Dr.

1760 To William Twist, Silkman, s. d.

May 14. For Smyrna Silk 112 lb. at $11\frac{1}{4}$ per oz. £28. Morea D°. 59 great lb. at 1 $8\frac{1}{2}$ June 5. Raw D°. 292 lb. at — 0 $9\frac{3}{4}$ 15. Bellandine ditto 259 lb. at 0 $11\frac{3}{4}$ 25. China D°. $13\frac{3}{4}$ great lb. at 3 130. Twisted Silk $18\frac{1}{2}$ lb. at 2 $10\frac{1}{4}$

£690 15 0

Mr. AUGUSTUS COMPOUND, Dr.

1764. To Messrs. Hervey and Smith.

l. s. d.

Sept. 5. For Gum Arabic $89\frac{3}{4}$ at 0 1 $0\frac{1}{2}$ per lb. £.Mestica Cochineal $17\frac{3}{8}$ at 1 11 630. Contrayerva $13\frac{1}{8}$ at 0 16 9Nov. 8. Turkey Rheub. $3\frac{1}{2}$ at 0 10 6 pr. oz.Sassafras 108 at — 0 0 $5\frac{1}{2}$ per lb.Dec. 29. Opium $8\frac{1}{4}$ at 0 5 9

£77 3 $3\frac{3}{4}$ 

A LETTER to a Factor.

To Mr. ARTHUR PAGE.

SIR,

This is to desire you to send me by the next ship 136 Firkins of butter, and 40 barrels of pork; which I hope you will procure for me at a reasonable Price, and the first opportunity that offers draw on me for the amount which shall receive due honour from,

Sir,

London,

Your friend and servant,

Dec. 4, 1764.

THO. DODD.

The FACTOR'S ANSWER.

To Mr. DODD.

SIR,

Your's of the 1st instant I received, and according to your order have this day shipped on board the Cork 136 firkins of butter and 40 barrels of Pork. I do not doubt but

INVOICE from VIRGINIA.

Williamsbourg, June 1, 1760.

Invoice of Eleven Hogsheads of Tobacco, laden on board the Andalusia, Ebenezer Bradshaw, Master, consigned to Abraham Purser, Merchant, in London, for his proper Accompt and Risque, marked as per Margin; Contents, Costs, and Charges, viz.

To 11 Hhds. of the best Tobacco, wt. 67 1 11 } £.
Tare 2qrs. 7lb. per Hhd. Trett 4lb. per 104 at }
7d $\frac{1}{2}$. per lb.

C H A R G E S.

A. P.	For 11 empty Hhds.	25s.	}	£. 2 1 0
N ^o 8	Cooperage, hooping,			
to 19	and heading	16s.		
	Warehouse-room	—	—	0 15 6
	Boatage and Stowage	—	—	0 11 6
	Charges at shipping	—	—	0 18 3

To my Commission at 4 per Cent. 4 6 3

Errors excepted.

How much Sterling does the above Factory amount to, Ex^o at 125 per Cent.

per Jos. Orme.

Ans. £ 174 17 0

Rotterdam, Aug. 5, 1760.

Invoice of eight Pieces of Holland, nine Pieces of Cambrick, and eleven Pieces of Ghentish Cloth, shipped by me, Zach. Watson, on board the Great Britain, Robert Vernon, Master, and qsd. to Aaron Drawwater, Trader, in London, for his proper Accompt and Risque; marked as per Margin, Contents, Costs, and Charges, viz.

To 8 Ps. of Holland, qt. 387 $\frac{1}{2}$ Ells Flem.	}	G S. P.
bought of Geo. Vandergucht, at 1guil. 5stiv. per Ell.		
To 9 Ps. of Cambrick, qt. 142 $\frac{3}{4}$ Ells Flem.	}	
bought of ditto at 1guil. 2stiv. 11p. per Ell		
To 11 Ps. of Ghentish Cloth, qt. 119 Ells Flem. at 19stiv. per Ell	}	

Q

CHARGES.

170 *Commercial Correspondence.* ACCOMPTANT'S
CHARGES.

G.S. P.

	To Custom and Brokerage	£ 57 9 4	
N ^o 1	To Charges in buying	3 4 4	
to 28	To Canvas, folding, and tacking	3 1 7	
A. D.	To Warehouse-room	4 2 4	
	To boatage aboard	0 4 3	
			68 1 6
	To my Provision, at $2\frac{1}{2}$ per Cent.		
	What Sterling is Mr. Drawwater	£	
	accountable for the Course, of Ex ^o		
	being at 34s. 6d. Flem. per £. Ster.		
	Errors excepted.		per Zach. Waisson.

Ans. £ 81 18 10 $\frac{1}{4}$

INVOICE from FRANCE.

Boulogne, Oct. 8, 1764.

Invoice of five pipes of claret and nine pieces of prunes, laden by me, *Charles Hayes*, on board the Unicorn, *George Howe*, Master, for account of *Sig. Al. Bocalina*, Merchant in *Venice* and by bills of loading go qsd. to Mr. *Alexander Magnus* Merchant in London, marked as in the Margin.

Liv. S. D.

To 5 pipes of Claret, bought of *Monf. Jean Brecon* at 115 Liv. 12s. 6d. per pipe }
To 10 ps. of Prunes, bought of *Monf. Jacques Turquand*, Cont. viz.

N ^o . 1	879	N ^o . 6	942	
2	756	7	876	
3	572	8	587	
4	907	9	721	Gr.—lb
5	767	10	875	Tr.—89 $\frac{1}{2}$ each
				Nt.—at 6s 8 den per lb.

CHARGES.

	To Custom of the Wine, at	£. s. d.	
	11 l. per Pipe	55 0 2	
N ^o 1	Ditto Prunes, at 3/ls. 4den.		
to 5	per Ps.	1 13 4	
A.B.	Brokerage of the Wine, 18/ls.		
	per Pipe	4 10 0	
	Ditto Prunes, 3/ls. 3den. per Ps.	1 12 6	

Charges

	£.	s.	d.	£.	s.	d.
Charges in buying	0	18	0			
Cooperage, Hoops, &c.	1	2	0			
Cartage and Portage	1	11	5			
Warehouse-room	1	8	0			
Boatage and Stowage	5	4	0			
Warfage, Crane, and Dispatch	2	5	6			
The Poor's Box	3	1	0			
Port Charges of the said Ship	1	7	8			

To my Provision, at $2\frac{3}{4}$ per Cent.

79 13 5

How much Sterl. must
Mr. Magnus pay, on Ac-
count of the above Fac-
tory, Ex^o $31d\frac{1}{2}$. per Fr.
Crown.

Errors excepted

per Cha. Hayes.

Ans. £ 134 5 $3\frac{3}{4}$

An Account of Sales of 140 Quarters of Wheat, 35 Bales of Woollen Cloth, 187 Pieces of Irish Linen, 5 Tons of Cheese, received from on board the Albion, Capt. Brown, Master, from London, on Account of Mr. John Alfop, is

Dr.

	l.	s.	d.	l.	s.	d.
To Portage of ditto	2	19	8			
To Storage, $2\frac{1}{8}$ per Cent.	42	10	$3\frac{5}{8}$			
To Commission on Sales, $3\frac{3}{8}$ per Cent.	67	10	$5\frac{3}{4}$			

To Mr. John Alfop, for the Nt. Proceeding 113 0 $5\frac{5}{8}$
1887 13 11 $\frac{3}{4}$

£ 2000 14 5

Contra.

Cr.

By Tho. Scott, sold him 140 Quarters }
of Wheat, at 38s. 6d. per Quarter }
By George Lemiss, for 35 Bales of Cloth, }
each containing 28 $\frac{1}{2}$ Yards, at 27s. }
6d. per Yard }
By ditto for 84 Ps. of Irish Linen, qt. }
387 Yards, at 3s. 2d. per Yard }

Q 2

By

172 *Commercial Correspondence.* ACCOMPTANT'S

By Alex. Lee, for 103 Yards of ditto, } £
 qt. 476 Yards, at 3s. 1d. per Yard -- }
 By James Neale, for 5 Tons of Cheese, }
 at 45s. per C. wt. ----- }

Errors excepted.

£ 2000 14 5

Naples, May 5, 1765.

per *Alphonso Wearman.*

A Country Chapman's Order for Goods.

To Mr. *Alfred Dunbar*, *East Grinstead*, Dec. 23, 1764.

S I R,

Yours of the 18th inst. I received, as also the Goods, for the Value of which I have here inclosed you a Bill for 148l. 12s. 6d. on Mr. Augustus Newman, Merchant, in Cheapside, London, payable 20 Days after Date: I must desire you to send me, with all convenient Speed, the following Goods, viz. $\frac{1}{4}$ Butt of Currants, 2 Frails of Malaga Raisins, 2 Chests of Prunes, 3 Barrels of Figs, 1 Barrel of Ginger, Sugars at 3d. 4d. and 5d. per Pound each, 1 Hhd. of Poland Starch, $\frac{1}{2}$ C. wt. of common Starch, $\frac{1}{4}$ C. wt. of Battle Gunpowder, $\frac{1}{2}$ C. wt. of Rosin, and 18lb. of Salt Petre. Please to send a Bill of Parcels with the above, to Sir,

Your humble Servant,

John Booker.

£ 48 12 6

S I R,

East Grinstead, Dec. 23, 1764.

Twenty Days after Date pay Mr. Alfred Dunbar, or Order, One hundred and Forty-eight Pounds Twelve Shillings and Six-pence, Value of himself; and place it, without further Advice, to Accompt of

To Mr. *Augustus Newman*,
 Merchant, London.

John Booker.

The A N S W E R.

To Mr. *John Booker*,

London, Jan. 18, 1765.

S I R,

I received yours of the 23d ult. with the Bill inclosed, which is now accepted. The Goods you wrote last for I have this Day sent by Jonah Meadows, the Carrier; the particular Quantity and Prices are expressed in the Bill of Parcels hereunto annexed, which I hope you will find agreeable to your Order; and for any Goods you have occasion for in my Way, none shall use you better than

Sir,

Your humble Servant,

Alfred Dunbar.

Sold

Sold to Mr. John Booker, of East Grinstead, Jan. 18, 1764.

C. 2. lb. lb. s. d.

$\frac{1}{4}$ Butt of Currants, wt. Gr.	5	2	7	Tr. 85 at o	$3\frac{3}{4}$ per lb. Nr. £
2 Fr. of Malaga Raisins	1	2	13	Tr. 16 at o	$3\frac{1}{2}$
2 Chests of Prunes - -	3	1	14	Tr. 43 at o	$2\frac{3}{4}$
3 Barrels of Figs - -	4	3	7	Tr. 67 at o	$3\frac{1}{4}$
1 ditto of Ginger - .	1	2	3	Tr. 19 at o	3
1 Hhd. of Sugar - -	4	3	8	Tr. 71 at o	3
Ditto - - - -	4	1	11	Tr. 62 at o	4
Ditto - - - -	3	3	8	Tr. 57 at o	5
1 C. of Poland Strach - - - -	-	-	-	at o	$3\frac{1}{2}$
$\frac{1}{2}$ Cwt. of common ditto - - - -	-	-	-	at o	3
$\frac{1}{4}$ Cwt. of Battle Gunpowder - - - -	-	-	-	at 1	$3\frac{1}{2}$
$\frac{1}{2}$ Cwt. of Rosin - - - - -	-	-	-	at o	$2\frac{1}{4}$
18 lb. Salt Petre - - - - -	-	-	-	at o	9

£48 18 4 $\frac{1}{4}$

Various Forms of RECEIPTS.

Received May 24, 1764, of Mr. George Paywell, Five Pounds Five Shillings, in full of all Demands.

£ 5 5

Abel Cash.

When only a Part of a Bill is paid, write the Receipt thus:

Received the 15th of June, 1764, of Mr. Stephen Ayres, Fourteen Pounds Fourteen Shillings, on Account.

£ 14 14

Thomas Lovemoney.

Received the 8th of July, 1764, of Mr. William Adams, Eight Pounds Eight Shillings, in Part of a Bill of Nineteen Pounds Six Shillings and Three Pence.

£ 8 8

Robert Bentley.

For the Balance of an Account, write under the Bill thus:

Received the of 1764, the Balance of this Account.

William Hill.

N.B. But if the Receipt is wrote on a separate Piece of Paper; write it, in full of all Demands, or on Account as the Case requires.

For Money received in Partnership.

Received the 18th of April, 1764, of Mr. Timothy Atkins,

174 *Receipts.*

ACCOMPTANT'S

kins, Twelve Pounds Four Shillings, in full of all Demands, for Self and Company.

£ 12 4

James Ferguson.

Received March 12, 1764, of Mr. *William Young*, Twenty Pounds, on Accompt for Peter Turner and Self.

£ 20

Philip Beyd.

For Money received for another Person.

Received Feb. 4, 1765, of Mr. Henry Powell, Nine Pounds Four Shillings, in full of all Demands, for my Father, George Simpson.

£ 9 4

William Simpson.

Received Aug. 8, 1764, of the worshipful Company of Grocers, Two Hundred and Ten Pounds, on Accompt for Alexander Bowman and Company.

£ 210

James Diligent.

For Money received of one Person, by the Hands of another.

Received May 6, 1764, of Sir Thomas Smith, by the Hands of Mr. Paul Truffy, One Hundred Pounds, on Accompt.

£ 100

Nathaniel Rose.

Received the of 1764, of the Right Hon. James Duncombe, Esq; Lord Mayor of York, by the Hands of Mr. Francis Bayley, One Hundred and Fifteen Pounds Three Shillings, in full of all Demands, for Masons Work done on his Estate at Wakefield.

£ 115 3

John Stone.

For Money received of one Person by the Hands of another, for another Person.

Received of Mr. Anthony Timewell, by Order, and on Accompt of Messrs. Molineux and Green, Fifty Pounds, for Mr. Henry Haddoe, this of 1764.

£ 50

Edward Stewart.

Received the of 1764, of James Manwaring, Esq; by the Hands of Mr. William Gilbert, Four Hundred Pounds, for Mess. Crawley and Company.

£ 400

Samuel Osman.

For

For an Annuity and Interest of Money.

Received the 14th of January, 1765, of Mr. Michael Cashier, One Hundred and Fifty Pounds; and is in full for two quarterly Payments of my Annuity, due at Michaelmas and Christmas Day last.

£ 150

Jonathan Receiver.

Received the 9th of January, 1764, of Mr. Peter Sheppard, Twenty Pounds, in full for Six Months Interest of Eight Hundred Pounds, due at Christmas last

£ 20

Moses Solomon.

For Salary and Wages.

Received April 8, 1764, of Mr. Thomas Generous, Twelve Pounds Ten Shillings, in full for a Quarters Salary, due Lady-day last.

£ 12 10

George Entry.

Received of Mrs. Anne Watson, One Pound Fifteen Shillings, in full for a Quarters Wages, due this 24th Day of June, 1764.

£ 1 15

Ann Labour.

For Rent.

Received Oct. 6, of Mr. John Tenant, Three Pounds, in full for a Quarters Rent, due at Michaelmas last.

£ 3

Isaac Heather.

Received May 6, 1764, of Mr. Thomas Farmer, Twenty-five Pounds, in full for half a Year's Rent, due Lady-day last, for the Use of Jacob Ancram, Esq;

£ 25

Edward Telmory.

Received the 14th of January, 1763, of M. Philip Goodpay, a Note of his Hand, for Twenty-five Pounds, due four Months after Date, which, when paid, is in full of all Demands.

£ 25

Jacob Fowle.

N.B. When a Note of Hand is given for the Payment of a Book-debt, instead of Cash, make use of the above Form; it being not safe to give a Note of Hand without a Receipt; because both Note and Book-debt are equally recoverable.

Promissory Notes.

Promissory Notes for a valuable Consideration, should always mention the Value received, if the Thing itself is not specified; which gives them a Validity in a Court of Judicature.

Promissory Notes payable to C. D. or Order, are indorssible from one Person to another; which is done by the present Possessor's writing his Name on the back of the Note, and delivering it up to the Party, whose Property it is to be.

It is unnecessary to Indorse a Promissory Note payable to Bearer, if the Note is good; but it is requisite to have a Receipt wrote thereon, when it is paid and delivered up, to prevent its being negotiated afterwards.

Promissory Notes and Book Debts, if not legally demanded in Six Years, cannot be recovered by Law.

London, May 1st, 1764.

I Promise to pay Mr. Aaron Egmont or Bearer on demand, Ninety-four Pounds. Value receiv'd.

£94

Adam Wright.

Croydon, Aug. 19th, 1764.

I Promise to pay George Needham, Esq; or Order on Demand, Two Hundred and Fifty Pounds. Value received for Mess. King and Alfray.

£250

Thomas Eglinton.

Bath, June 13th, 1764.

Borrowed and Received of Mr. Richard Harcourt, Fifty Pounds, which I promise to pay on Demand.

£50

Leonard Bond.

London, July 4th 1764.

I promise to Pay Mr. George Friendly or Order, Fourteen Days after Date, Fifty-two Pounds Ten Shillings. Value received.

£52 10 0

Hugh Wantmoney.

York, June 5th, 1764.

I promise to pay Mr. Roger Goodfriend, or Order, Ten Pounds Ten Shillings, Two Months after Date for Value received.

£10 10

James Needham.

A Joint Note for M O N E Y Borrowed.

We jointly and separately Promise to Pay Mr. Simon Goodman, or Order on Demand, the Sum of Sixteen Pounds, Value received the 10th of January, 1765.

£16

Thomas Johnson,

James Hearty.

Promissory

COMPANION.

Bills of Exchange. 177

Promissory Notes, as Used by Servants and Apprentices.

Maidstone, Feb. 8, 1765.

I promise to pay Mr. Joshua Bright, or Bearer on Demand
Thirty Pounds

For Sir James Brooks and Partners.

William Clark.

£30

London, Aug. 9, 1764.

Ten Days after Date, I promise to pay Mr. Henry Todd,
or Order, Eight Pounds, Eight Shillings,

For my Father Joshua Amos,

Joshua Amos, junior.

£8 8

Inland BILLS of EXCHANGE.

Woolwich, Feb. 11. 1765. £28

At Sight Pay Mr. Bartholomew Gibbs, the Sum of
Twenty Eight Pounds, the Value received of Mr. Arthur
White, and Place it to Accompt, as *per* Advice from

To Mr. Stephen Fenn,
Grocer, Strand, London.

James Newman.

Brentford, Dec. 15. 1764. £40

At Twelve Days Sight, Pay Mr. Daniel Dixon, or Or-
der, the Sum of Forty Pounds for Value received of Sir
David Johnson, and place it to Account, as *per* Advice from

To Mr. Job Harriſs, Mer-
chant, Fenchurch-Street,
London.

Abraham Davenport.

Edinburgh, Feb. 20, 1765. £60

Two Months after Date, Pay to Sir John Eyles, or Or-
der, Sixty Pounds Sterling, Value received of the Right
Hon. the Lady Dandafs, and place it as advised by

To Sir Jacob Orme, Charing-
Cross, London.

George Allpay.

Am



An APPENDIX of *Cross-Multiplication.*

As used by ARTIFICERS and WORKMEN.

General Rule.

Feet multiplied by Feet produce Feet ; Feet multiplied by Inches, produce Inches ; Feet multiplied by Parts produce Parts, every Twelve being one Inch.

Inches multiplied by Inches, produce Parts ; Inches multiplied by Parts, produce Seconds, every Twelve being one Part. Parts multiplied by Parts produce Thirds, every Twelve being one Second.

Note. Glazing, Mafons Flatwork, rubbed and gauged Brick-work, are measured by the Foot Square.

Paving, Painting, Plaistering, Wainfcoting, &c. are measured by the Square Yard of 9 Feet.

Tyling, Raftering, Flooring, Partitioning, &c. are measured by the Square of 100 Feet.

Common Brick-work is measured by the rod of $16\frac{1}{2}$ Feet, containing $272\frac{1}{4}$ Square Feet, but if the Wall be not one Brick and a half thick, it must be reduced to that Standard by this.

Rule, Multiply the superficial Content of the Wall, by the Thickness thereof in half Bricks, divide that Product by 3, and the Quotient is the Area.

EXAMPLES.

1. Multiply 9 F. 3 I. by 4 F. 6 I. By Decimals, by Vulgar By Duodecimals. By X Mul. Ft. Fractions.

$$\begin{array}{r} 9 \text{ F. } 3 \text{ I.} \\ 4 \text{ F. } 6 \text{ I.} \\ \hline 4 \text{ F. } 7 \text{ I. } 6 \text{ P.} \\ 37 \text{ O.} \\ \hline 41 \text{ F. } 7 \text{ I. } 6 \text{ P.} \end{array}$$

$$\begin{array}{r} 4 \text{ F. } 7 \text{ I. } 6 \text{ P.} \\ 37 \text{ O.} \\ \hline 41 \text{ F. } 7 \text{ I. } 6 \text{ P.} \end{array}$$

$$\begin{array}{r} 41 \text{ F. } 7 \text{ I. } 6 \text{ P.} \\ \hline \end{array}$$

$$\begin{array}{r} \text{By Practice} \\ 9 \text{ F. } 3 \text{ I.} \\ 4 \text{ F. } 6 \text{ I.} \\ \hline 4 \text{ F. } 7 \text{ I. } 6 \text{ P.} \\ 37 \text{ O.} \\ \hline 41 \text{ F. } 7 \text{ I. } 6 \text{ P.} \end{array}$$

$$\begin{array}{r} 41 \text{ F. } 7 \text{ I. } 6 \text{ P.} \\ \hline \end{array}$$

$$\begin{array}{r} 41 \text{ F. } 7 \text{ I. } 6 \text{ P.} \\ \hline \end{array}$$

$$\begin{array}{r} 9 \text{ F. } 3 \text{ I.} \\ 4 \text{ F. } 6 \text{ I.} \\ \hline 41 \text{ F. } 7 \text{ I. } 6 \text{ P.} \end{array}$$

$$\begin{array}{r} 41 \text{ F. } 7 \text{ I. } 6 \text{ P.} \\ \hline \end{array}$$

$$\begin{array}{r} 41 \text{ F. } 7 \text{ I. } 6 \text{ P.} \\ \hline \end{array}$$

$$\begin{array}{r} 41 \text{ F. } 7 \text{ I. } 6 \text{ P.} \\ \hline \end{array}$$

$$\begin{array}{r} 41 \text{ F. } 7 \text{ I. } 6 \text{ P.} \\ \hline \end{array}$$

$$\begin{array}{r} 41 \text{ F. } 7 \text{ I. } 6 \text{ P.} \\ \hline \end{array}$$

$$\begin{array}{r} 9 \text{ F. } 25 \text{ I.} \\ 4 \text{ F. } 5 \text{ I.} \\ \hline 41 \text{ F. } 625 \text{ I.} \\ 3700 \text{ I.} \\ \hline 41,625 \text{ I.} \\ 12 \text{ I.} \\ \hline 7,500 \text{ I.} \\ 12 \text{ I.} \\ \hline 6,000 \text{ I.} \end{array}$$

$$\begin{array}{r} 41 \text{ F. } 625 \text{ I.} \\ 3700 \text{ I.} \\ \hline 41,625 \text{ I.} \\ 12 \text{ I.} \\ \hline 7,500 \text{ I.} \\ 12 \text{ I.} \\ \hline 6,000 \text{ I.} \end{array}$$

$$\begin{array}{r} 41 \text{ F. } 625 \text{ I.} \\ 3700 \text{ I.} \\ \hline 41,625 \text{ I.} \\ 12 \text{ I.} \\ \hline 7,500 \text{ I.} \\ 12 \text{ I.} \\ \hline 6,000 \text{ I.} \end{array}$$

$$\begin{array}{r} 41 \text{ F. } 625 \text{ I.} \\ 3700 \text{ I.} \\ \hline 41,625 \text{ I.} \\ 12 \text{ I.} \\ \hline 7,500 \text{ I.} \\ 12 \text{ I.} \\ \hline 6,000 \text{ I.} \end{array}$$

$$\begin{array}{r} 41 \text{ F. } 625 \text{ I.} \\ 3700 \text{ I.} \\ \hline 41,625 \text{ I.} \\ 12 \text{ I.} \\ \hline 7,500 \text{ I.} \\ 12 \text{ I.} \\ \hline 6,000 \text{ I.} \end{array}$$

$$\begin{array}{r} 41 \text{ F. } 625 \text{ I.} \\ 3700 \text{ I.} \\ \hline 41,625 \text{ I.} \\ 12 \text{ I.} \\ \hline 7,500 \text{ I.} \\ 12 \text{ I.} \\ \hline 6,000 \text{ I.} \end{array}$$

$$\begin{array}{r} 9 \text{ F. } \frac{3}{4} \text{ I.} \text{ by } 4 \text{ F. } \frac{6}{4} \text{ I.} \\ \frac{37}{4} \text{ I.} \times \frac{9}{2} \end{array}$$

$$\begin{array}{r} 9 \text{ F. } \frac{3}{4} \text{ I.} \text{ by } 4 \text{ F. } \frac{6}{4} \text{ I.} \\ \frac{37}{4} \text{ I.} \times \frac{9}{2} \end{array}$$

$$\begin{array}{r} 9 \text{ F. } \frac{3}{4} \text{ I.} \text{ by } 4 \text{ F. } \frac{6}{4} \text{ I.} \\ \frac{37}{4} \text{ I.} \times \frac{9}{2} \end{array}$$

$$\begin{array}{r} 9 \text{ F. } \frac{3}{4} \text{ I.} \text{ by } 4 \text{ F. } \frac{6}{4} \text{ I.} \\ \frac{37}{4} \text{ I.} \times \frac{9}{2} \end{array}$$

$$\begin{array}{r} 9 \text{ F. } \frac{3}{4} \text{ I.} \text{ by } 4 \text{ F. } \frac{6}{4} \text{ I.} \\ \frac{37}{4} \text{ I.} \times \frac{9}{2} \end{array}$$

$$\begin{array}{r} 9 \text{ F. } \frac{3}{4} \text{ I.} \text{ by } 4 \text{ F. } \frac{6}{4} \text{ I.} \\ \frac{37}{4} \text{ I.} \times \frac{9}{2} \end{array}$$

Facit 41 F. 7 I. 6 P.

2 Mul.

	F.	I.	F.	I.	P.
2 Multiply	2	3	by 1	4	Facit 3 0 0
3 Multiply	4	6	by 3	7	Facit 16 1 6
4 Multiply	5	7	by 1	8	Facit 9 3 8
5 Multiply	6	3	by 2	9	Facit 17 2 3
6 Multiply	7	6	by 9	3	Facit 69 4 6
7 Multiply	12	11	by 7	9	Facit 100 1 3
8 Multiply	20	7	by 6	11	Facit 142 4 5
9 Multiply	21	3	by 9	10	Facit 208 11 6
10 Multiply	25	11	by 10	7	Facit 274 3 5
11 Multi.	30	6	by 12	5	Facit 378 8 6
12 Multi.	35	11	by 18	9	Facit 673 5 3
13 Multiply	42	8	by 21	7	Facit 920 10 8
14 Multiply	54	9	by 34	10	Facit 1907 1 6
15 Multiply	58	11	by 58	6	Facit 2268 3 6
16 Multiply	349	8	by 79	4	Facit 27740 2 8
17 Multiply	484	9	by 87	7	Facit 42456 0 3
18 Multiply	7	9	4p. by 5	10 6p.	Facit 45 8 4
19 Multiply	11	11	9 by 9	7 8	Facit 115 5 7 1"
20 Multiply	285	10	9 by 43	9 4	Facit 12515 10 7 4"
21 Mul.	28	9	10 8" by 14	8 4 6" F.	423 7 10 1" 10"

1 A Window is 6 Feet 6 Inches high, and 3 Feet 4 Inches broad, how many square Feet of Glazing are there? *Ans.* 21 Feet, 8 Inches.

2. If a Window be 8 Feet 4 Inches high, and 4 Feet 6 Inches broad, How many square Feet of Glazing are there? *Ans.* 39 Feet 6 Inches.

3. A Cieling is 13 Feet broad, and 17 Feet 4 Inches long. How many Yards doth it contain? *Ans.* 25 Yards.

4. A Floor is 24 Feet 6 Inches long, and 17 Feet 6 Inches broad. How many Squares doth it contain? *Ans.* 4 Squares 28 Feet 9 Inches.

5. If a Piece of Tyling be 40 Feet 6 Inches long, and 13 Feet 3 Inches broad. How many Squares are contained therein? *Ans.* 5 Squares 36 Feet, 7 Inches and a half, or 6 Ps. A Mason bought 6 Purbeck Stones, Contents as under, *viz.*

	F.	I.	F.	I.	F.	I.
1.	11	4	4	9	0	4
2.	8	9	3	4	1	6
3.	9	6	3	10	1	4
4.	12	6	4	3	0	8
5.	10	6	2	7	0	10
6.	7	8	2	11	0	9

What is the Solid Contents of the Whole?

F. I.

Ans. 179 9

7. If a Wall be 40 Feet long and 9 Feet 11 Inches high and $1\frac{1}{2}$ Brick thick, how many Rods doth it contain? *Ans.* 1 Rod 124 Feet 5 Inches.

8. If a Wall of 2 Bricks thick be 50 Feet 6 inches long and 14 Feet 9 Inches high how many Rods doth it contain? *Ans.* 3 Rods 176 Feet 5 Inches.

9. If a Board be 7 Feet 6 Inches long, and 1 Foot 5 Inches broad, what is the Superficial Content? *Ans.* 10 Ft. 11 Inches.

10. If a Room be 27 Feet 6 Inches long, and 17 Feet 5 Inches broad, how many square Feet are contained in that Room? *Ans.* 478 Feet 11 Inches.

11. If a Room be 109 Feet 6 Inches round, and 12 Feet 4 Inches high how many square Feet are contained therein? *Ans.* 1350 Feet 6 Inches.

12. Suppose a Piece of Wood is 1 Foot 5 Inches square, and 20 Feet 6 Inches long, how many solid Feet are contained therein? *Ans.* 41 Feet, 1 Inch, 8 Parts, 6 Seconds.

13. If a Pane of Glafs be 1 Foot, 3 Inches, 6 Parts long, and 10 Inches 5 Parts broad, and 18 Panes in that Window, how many square Feet are contained therein? *Ans.* 20 Feet 2 Inches 2 Parts 3 Seconds.

14. Suppose a House to have 3 Tiers of Windows with 3 in a Tier, the Height of the first to be 8 Feet 5 Inches, the second 7 Feet 4 Inches, the third 5 Feet 9 Inches, and the breadth of each 3 Feet 3 Inches, what will the glazing come to at 15 *d.* per Foot? *Ans.* 20*l.* 6*s.* 4 $\frac{1}{2}$ *d.*

15. What will be the Product of 478 Feet 10 Inches, multiplied by 249 Feet 9 Inches? *Ans.* 119589 Feet, 3 Inches.

16. Multiply 57 Feet, 10 Inches, 7 Parts, by 38 Feet 10 Inches, 11 Parts. Facit 2252 Feet, 2 Inches, 0 Parts, 6 Seconds, 5 Thirds.

17. A Marble Slab of 7 Feet 9 Inches in Length, and 2 Feet 3 Inches in Breadth, I demand the value at 5*s.* 5 $\frac{1}{4}$ *d.* per Foot? *Ans.* 4*l.* 15*s.* 2*d.*

18. If a Wall be 74 Feet 9 Inches long, and 12 Feet 6 Inches high, and $2\frac{1}{2}$ Bricks thick, how many Square Rods are contained therein, and what is the Value at 6*l.* 10*s.* per Rod? *Ans.* £37 8*s.* 7*d.*

19. If a Cieling be 37 Feet 7 Inches in Length, and 17 Feet 5 Inches in breadth, what will the Plaistering come to at 9 $\frac{1}{2}$ *d.* per Yard? *Ans.* 2*l.* 17*s.* 7*d.*

20. Suppose the Length of the Front of a House be 34 Feet 6 Inches, and the Breadth 21 Feet 9 Inches, what will be the Expence of Paving it at 3s. 9d. per Yard? *Ans.* 15l. 12s. 7½d.

21. A Triangular Skylight, whose Base is 10 Feet 9 Inches long, and the Perpendicular 17 Feet 11 Inches, what will the Glazing come to at 9½d. per Foot? *Answer* 3l. 18s. 2¾d.

Note, All Triangles are equal to ½ the Parallelogram, whose Length is the same as the Base of the Triangle, and Breadth equal to the Perpendicular. Then to get the Area of a Triangle, multiply ½ the Base by the Perpendicular, or ½ the Perpendicular by the Base; and the Product is the Area.—Or multiply the whole Base by the Perpendicular, and divide the Product by 2, gives the Area as before.

22. Suppose the Compass of a Room be 110 Feet 9 Inches, the Height 11 Feet 3 Inches (taking in the Cornish and Mouldings) 3 Window Shutters, each 8 Feet 4 Inches, and the Door 8 Feet 9 Inches, by 3 Feet 10 Inches, the Shutters and Doors being worked on both Sides is reckoned Work and half Work; what will the Wainscotting of the Room come to at 5s. 6d. per Yard square? *Answer* 44l. 9s. 6½d.

23. A Gentleman agreed with a Paper Hanger, for 5 Rooms to be hung with Paper, 1 Foot 9 Inches broad, at 8½ per Yard, the Contents whereof are under expressed; what did the whole amount to?

		Feet In.				F. I.	
The {	1ft.	{	110	7	{	10	9
	2d.		95	4		9	7
	3d.		87	8		8	6
	4th		79	11		8	7
	5th		73	10		7	9
		Room is		Round and		{ high	
		Answer 27l. 13s. 11d.					

Note, Divide the whole Content by the square Feet in a Yard of Paper.

24. A Plaisterer agreeth about a Piece of Work, the Contents as under for Lathing and Plastering, he was to have 10½ per Yard square, for Rendering Work 3½d per Yard square, what did each amount to?

R

Lathing

182 Cross Multiplication.

Lathing and Plaistering

F.	I.	F.	I.
20	0 by	9	0
15	6 by	9	0
14	9 by	8	4
16	10 by	9	0
20	0 by	15	6
20	4 by	11	6
15	10 by	11	6
13	10 by	11	6
15	4 by	11	6
20	4 by	15	10
20	8 by	9	4

ACCOMPTANT'S

Rendering Work

F.	I.	F.	I.
18	5 by	8	8
14	3 by	15	2
14	2 by	13	2
15	7 by	8	8
18	11 by	10	10
15	2 by	10	10
13	2 by	13	11
14	6 by	14	10
18	9 by	8	7
15	2 by	8	7
13	11 by	8	7

Answer { Lathing and Plaistering 10*l.* 11*s.* 0*2**d*
 Rendering Work 3 0 8*3**4*

25. A Carpenter bought 8 Pieces of Fir, Contents as under, viz.

No.	F.	I.	F.	I.	F.	I.
1	15	9	1	5	1	7
2	14	10	1	3	1	6
3	16	4	1	7 <i>1</i> <i>2</i>	1	9
4	11	6	2	5	1	10
5	15	7	1	6	1	5 <i>1</i> <i>2</i>
6	17	9 <i>1</i> <i>2</i>	1	11	1	4
7	14	6	2	2	1	10
8	15	9	1	9	1	3

Length

Breadth

Thickness

What is the solid Content of the whole, and what is the Value at 5*s.* 9*d.* per Foot solid?

Answer { The solid Content 332 Feet, 1 Inch, 9 Parts.
 The Value of the whole 95*l.* 9*s.* 10*d.*

26. Admit the end Wall of a House 34 Feet 10 Inches in Length, and the Height from the Ground to the Roof is 49 Feet 10 Inches, the triangular Part, or Gable at Top, to rise 39 Courses of Bricks, reckoning 4 Courses to a Foot; now the first 10 Feet high, 3 Bricks thick, the next 12 Feet 2*1**2* Bricks thick, the next 12 Feet 2 Bricks thick; and 15 Feet 10 Inches at 1*1**2* Brick thick, the Gable 1 Brick thick, what will be the Expence at 6*l.* 15*s.* per Rod? Answer 67*l.* 14*s.* 3*3**4**d.*

27. Admit

27. Admit a Piece of squared Timber to be 2 Feet 7 Inches thick, 1 Foot 9 Inches broad, and 15 Feet 6 Inches long, I demand how many solid Feet are contained therein, and what it comes to at 2s. 9½d. per Foot? *Answer* 9l. 15s. 8d.

28. Suppose the Roof of a House covered with Slates, and the depth on both Sides (with the usual Allowance being made) is 41 Feet 7 Inches, and the Length 53 Feet 3 Inches, the Question is to know how many squares of Slatting are contained therein, and what will be the Expence at 6l. 18s. per Square.

Answer { Squares 22 10 Feet 9 Inches.
The Expence 152l. 10s. 11¼d.

29. I have 2 Vaults to be dug by the Floor, the Length of the first is 42 Feet 7 Inches, and the Breadth 22 Feet 7 Inches; the Length of the second is 29 Feet 6 Inches, and the Breadth is 16 Feet 4 Inches, their Depths are to be 7 Feet 10 Inches, the Question is to know how many Floors of Earth are in these Vaults? *Answer* 34,8996 Floors.

Note, That 18 Feet square, and a Foot deep is a Floor of Earth, that is 324 solid Feet.

30. A Carpenter bought a Piece of square Timber at 1s. 9d. per Foot, being 17½ Inches square at the greater End; and 11½ Inches at the lesser End; and 18 Feet long, I desire to know the Value? *Answer* 2l. 7s.

31. Suppose a rectangular Cistern be 10 Feet 6 Inches long, 4 Feet 9 Inches broad, and 5 Feet 6 Inches deep, how many solid Feet are contained therein? *Answer* 274 Feet 3 Inches 9 Parts.

32. Having agreed with a Pavieur, to pave a Courtyard 38 Feet 9 Inches in Front, and 98 Feet 7 Inches in Depth, being minded to have a Foot-Path, the Depth of the Court 5 Feet 6 Inches broad, to be laid with Purbeck Stone at 5s. 6d. per Yard square, and the rest with Pebbles at 2s. 9d. per Yard, I desire to know what the whole Expence will be? *Answer* 66l. 12s. 10¼d.

33. Admitt a Piece of Timber to be 29 Inches in Breadth, and 18 Inches in Depth at the greater End, and 14 Inches in Breadth and 8 Inches in Depth at the lesser End, and 24 Feet long, how many Feet of Timber are contained

184 *A Collection of Questions.* ACCOMPTANT'S
 contained therein, and what is the Value at 1s. 7d. per solid
 Foot? *Answer* 3l. 17s

34. How many Tons of Timber are contained in a Tree
 15 Feet 9 Inches in the Girt, 75 Feet 6 Inches long, and
 what is the Value at 2l. 17s. 9d. per Ton?

Answer { 37 Tons, 10 Feet, 5 Inches
 Value 102l. 11s. 9½d.

Note, 50 Feet is a Load of Timber, and 40 Feet is a Ton.

35. A Piece of Marble 4 Feet 7 Inches long, and 2
 Feet 6 Inches broad, and 1 Foot 10 Inches thick, weighs,
 720lb. how many Cubic Feet must there be to freight a
 Ship of 500 Tons, and what will be the Value at 5s 9d per
 solid Foot?

Answer { 3266,66 Cubic Feet
 The Value is 939l. 13s. 3¼d.

A COLLECTION of QUESTIONS.

1. A Man said to another, I think you had this Year
 2000 Lambs, so I had, said the other; but what with pay-
 ing the Tythe, and three several Losses, they are much
 abated; for at one Time I lost half as many as I have now
 left; at another Time $\frac{1}{3}$ so many, and at the third Time
 $\frac{1}{4}$ so many: I demand how many he had left? *Answer*
 864 Lambs.

2. A Gentleman lets out a certain sum at 6l. per cent.
 Simple Interest, which Interest in 10 Years time, wanted
 but 12l. of the Principal; I demand the Principal? *Answer*.
 30l.

3. An honest Country Farmer being asked the Number of
 his Cattle, answered thus: $\frac{1}{10}$ are Oxen, $\frac{1}{5}$ Cows, $\frac{1}{2}$ Sheep,
 and $\frac{1}{8}$ Hogs, besides 15 good horses: What were the Num-
 ber of each? *Answer*. 20 Oxen, 40 Cows, 100 Sheep, 25
 Hogs, 15 Horses.

4. A Surveyor remembers that in a Rectangle, the Square
 of one Side multiplied by the Square of the other, Pro-
 duced 5184 square Feet, from which he is to find the Area
 of the Triangle? *Answer*. 36 Feet.

5. Suppose

5. Suppose a Cannon placed Parallel to the Horizon, in the Latitude of $00^{\circ} 00''$, and it was to fling a Ball in a straight Line 1000 Miles: I demand how far the Ball would have to fall to the Earth, and how far it would be from the Cannon when it fell to the Ground? *Ans.* 123,56 Miles to fall, and 876,44 Miles from the Cannon.

6 A Farmer ordered his Servant to Cultivate his Land, desiring him to Plough an Acre *per* Day; suppose the Land half a Mile long, and every Furrow to cut $7\frac{1}{2}$ Inches in Breadth, I desire to know how many Miles the Plough must go to complete the same? *Answer* 13 Miles, 1 Furrow long, 24 Perches.

7. I want to know the Length of a Cord one End fixed to the Ground, the other tied to my Horse, that he may have the Liberty of Eating an Acre of Grass and no more? *Ans.* 7,1366 Perches.

8. There is a right Angled Triangle whose Content is 384 Feet, and the Hypothenuse is 48 Feet, what are the Sides? *Ans.* the Base 44,66 Feet, the Perpendicular, 17,33 Feet.

9. A and B between them owe 174 Crowns, A pays 3 Crowns *per* Day, and B pays the first Day 1 Crown, the Second 2, the Third 3, and so on: In how many Days will they clear the Debt, and how much did each owe? *Ans.* 12 Days, A owed 96, and B 78 Crowns.

10 What two Numbers are those, whose Product is 108, and the Difference of their Squares 63? *Ans.* 12 and 9.

11 Find the Sides of a Cube whose Superficial is to the Solidity, as 6 to 11? *Ans.* 11.

12. Find the Side of a Square whose Area is to the Sum of the Sides, as 45 to 12? *Ans.* 15.

13. Two Merchants A and B go Partners, B brings 420*l.* and A received out of the Gains 52*l.* The Sum of both their Shares is 854*l.* how much did A put in, and how much did B receive out of the Gains? *Ans.* A's Stock 312*l.* and B's Gain 70*l.*

14. Two Men speaking of the Number of Acres each had, says A my Acres are in Proportion to yours as 3 to 2, I know it answered B, and the Sum of our Acres are in Proportion to the Sum of their Squares, as 1 to 13, how many Acres had each? *Ans.* A 15 and B 10.

15. Suppose a square Field to be measured, and by some certain Impediments you can come at neither Side, only

186 *A Collection of Questions:* ACCOMPTANT'S

have a Foot-path of 40 Poles across it. I demand the Area of that Field; *Answer*. 5 Acres nearly.

16. A round Field 40 Rods diameter, to be Shared betwixt two Brothers, and they agree to share it from the Center to the Circumference. I demand how far the first must go in from the Center towards the Circumference for his Share, and how many Acres each will have?

Answer { 28,28 Rods from the Center
3 Acres, 3 Rods, 28,15 P. each.

17. Whoever makes a Tour round the Earth, must necessarily take a larger Compass with his Head than with his Feet, the Question is, how much larger, admitting the Person to be 6 Feet high? *Answer*. 37 Feet $8\frac{1}{2}$ Inches.

18. Suppose a Maypole 100 Feet high, and to fall a Foot every Day, I desire to know how many Days it will be a falling? *Answer*. $157\frac{1}{7}$ Days.

19. What principal Sum of Money put out at its equal Value *per cent.* for an equal number of Years, will raise $\frac{1}{2}$ the principal at simple Interest? *Answer*. 50l.

20. What must be the Diameter of a Concave Sphere that will just hold an English Gallon? *Answer*. 8,135 Inches.

21. A Person gained 30 Shillings a Week, how much may he spend *per Week* to have 500 Shillings together with the Expences of 4 Weeks remaining at the Years end? *Answer*. 18s. $11\frac{2}{3}d$.

22. There is a right angled Piece of Land, 3 Times as long as broad, and 12 more in Length, whose Area or Content is 180 Poles, how long and how broad is it? *Answer*. 30 Poles in Length and 6 in Breadth.

23. A Man buys some Ells of Cloth, for 70s. and finds that if he had 4 Ells more, he had then bought every Ell 2s. cheaper, how many Ells did he buy? *Answer*. 10 Ells.

24. A Wine Merchant bought as many Casks of Wine as cost him 600l. and Sold them out again at 31l. 10s. *per Cask*, by which he gained as much Money as one Cask cost him, I demand what he gave for each? *Answer* 17. 10s.

25. A Factor exchanged 5 French Crowns and 4 Dollars for 46s. English Money, also at another Time he Exchanged 7 French Crowns and 6 Dollars, each of these being of the same Value as the former for 66s. I demand the Value of a French Crown and also of a Dollar in English Money? *Ans*. 6s. a French Crown, 4s. a Dollar.

26. Divide

26. Divide 7 into two Parts, so that the Difference of their Squares which are made from the Triple of the less Part, and the Double of the Greater, may be 17? *Ans.* the Greater 4,405. the Lesser 2,595.

27. Let the Height of a Cone be 216 Inches, and the Diameter at the Base 40 Inches, to find the Diameter at 27 Inches from the Base? *Ans.* 35 Inches.

28. In a Circle is made a Square in such a Manner, that the Area of the Segment is found to contain 224 Inches, Now much is the Diameter? *Ans.* 56,9 Inches.

29. A round Pyramid 12 Inches diameter at Bottom, and 20 Inches long, I demand how far it must be cut from the Vertex so be divided into two equal Parts? *Ans.* 15,874 Inches.

30. The Area of an Equilateral Triangle is 700 Feet, I demand the Length of each Side? *Ans.* 37,41637 Feet the Side.

31. There is a right angled Piece of Land, which is 3 Times as long as broad, and if 18 Poles be separated from the Length, the Area or Content is 120 Poles, the Length and Breadth, is required? *Ans.* 12 the Length, and 10 Poles the Breadth.

32. It is required to divide 20 Shillings into 20 Pieces, consisting only of Sixpences and half Crowns? *Ans.* 5 half Crowns and 15 Sixpences.

33. Divide 24 Shillings into 24 Pieces, consisting only of Nine-pences and Thirteen-pence halfpennies? *Answer.* 8 Nine-pences and 16 Thirteen-pence Halfpennies.

34. I have the Promise of a Pusse of Guineas upon Condition I can tell the Number there is in it, I have this given the double of the Number, and 20 more than the Square Root of that Number added to its self, and that Sum added to its Square is equal to 194040, the Question is, what was the Number? *Answer* 200 Guineas.

35. A Gentleman desired to know the Value of 5 Books, whose Prices were fixed in the following Manner; the first Four made together 7*l.* 10*s.* the four Last 8*l.* 15*s.* the three Last with the First 8*l.* 5*s.* the three First with the Last 7*l.* 18*s.* the two Last and two First 8*l.* 10*s.* I desire to know the Price of each Book separately?

	<i>l.</i>	<i>s.</i>	<i>d.</i>		<i>l.</i>	<i>s.</i>	<i>d.</i>		<i>l.</i>	<i>s.</i>	<i>d.</i>
<i>Ans.</i> { 1st. B.	1	9	6	} 3d. B.	1	14	6	} 5th B.	2	14	6
{ 2d. B.	1	19	6		{ 4th B.	2	6		6		

36. A triangular Garden, each Side 120 Feet, and a Gentleman has a mind to make a round Fish-pond, the largest that can be made within the Garden; I demand the Diameter and Area of the Pond, and the Content of each remaining Corner of the Garden to plant Flowers in?

Answer { The Diameter of the Pond 6,82 Feet.
The Area of Ditto. 36, 5 Feet..
The Content of each Corner 8, 6 Feet..

37. A Farmer going to Market with Sheep, Weathers, Ewes and Lambs, for which he received 110*l.* he Sold the Weathers at 8*s.* a piece, his Ewes at 6*s.* his Lambs at 4*s.* a piece, for every Weather he had two Ewes, and for every Ewe he had three Lambs; I desire to know how many he had of each sort? *Answer* 50 Weathers, 100 Ewes, 300 Lambs.

38. A young Student had been to look upon a Clock, and being asked what o'Clock it was, answered between 5 and 6? but a more particular Answer being asked, he said, at that very Moment the Minute-hand and the Hour-hand were together, what was the Time of the Day? *Answer* 27 Minutes and 16 Seconds after 5.

39. Suppose the Circumference of a Conical Church Spire, be at the Base 59 Feet, and the Altitude 109 Feet, what will the Painting come to at 7½*d.* per Yard? *Answer* 11*l.* 4*s.* 1½*d.*

40. A Malster bought a Cistern in form of a Cylinder, the Diameter being 3 Feet 9 Inches, and the Depth 7 Feet 6 Inches, how many Quarters of Corn will it hold, admitting 2150¼ solid Inches to a Winchester Bushel? *Answer* 5 Quarters nearly.

41. A Gentleman had three Debtors, whose particular Sums he had forgot; but it appears that A and B together owed him 24*l.* 12*s.* B and C 29*l.* 15*s.* and A and C 30*l.* 9*s.* I desire to know each Man's Debt? *Answer* A 12*l.* 13*s.* B 11*l.* 19*s.* C 17*l.* 16*s.*

42. A square Pyramid each Side 20 Inches, and the Altitude 38 Inches, is required to be cut into three equal Parts parallel to the Base from the Vertex. I demand the Diameter of each Part, and how many Wine Gallons each will hold? *Ans.* The first Diameter 13,87 Inches, the 2d. 17,475 Inches, and the Content of each Part 6 Galls. nearly.

Note. To answer the above Question or any of the like Nature, make use of this Proportion. As the Solidity of the

the whole Cone or Pyramid : is to the Cube of its Altitude : : so is any given Part of the solidity : to the Cube of its Altitude whose Cube Root is the Length from the Vertex.

43. Two Men bought a piece of fine Marble with parallel Ends, being a conical Frustum; the Length of the slant Side was 6 Feet, the greater Diameter $4\frac{1}{2}$ Feet, and the lesser $1\frac{1}{2}$ Foot, and they agree to divide it into two equal Parts parallel to the ends; but he that has the Part next the greater End, shall pay to the other 3*d.* for every square Inch between the whole Superfices of the two Pieces, what must he receive that has the lesser End? *Answer* 1*l.* 8*s.* 6*d.*

44. Suppose a piece of Timber that is the Frustum of a square Pyramid, one side of the greater End is $3\frac{1}{2}$ Feet, one side of the lesser End $1\frac{1}{4}$ Foot, and the Length 40 Feet, the same is to be shared between three Brothers, the Eldest is to have $\frac{1}{2}$, the Second $\frac{1}{3}$, and the Youngest $\frac{1}{4}$, how far from the lesser End must the Saw be fixed for each of their Shares? *Answer* For the Eldest 26,7 Feet, for the Second 34,9 Feet.

45. I want in a Garden, an Iron Roller of 5 Feet long, and $1\frac{3}{4}$ Inch thick the outside Diameter to be 2 Feet, what will it cost me at $3\frac{1}{2}$ *d.* per *lb.* admitting $4\frac{1}{2}$ Ounces, to be the Weight of every Cubic Inch? *Answer* 30*l.* 2*s.* 0 $\frac{3}{4}$ *d.*

46. A Gentleman asked his Companion what Hour of the Day it was, who answered, the Days at this Time are 13 Hours long, now if $\frac{2}{3}$ of the Hours past be added to $\frac{1}{4}$ of the Remainder (reckoning from Sun rising) you will have the Hour desired, what was the Hour? *Answer* 9 Hours past, and four to come.

47. Alexander the Great, in Memory of Hephæstion his Friend, erected a publick Edifice in the form of a Cone; at the Death of this King there was a civil War, when the Vertex of the above Structure was demolished: Sometime afterwards Antipater gave Orders for the same to be completed, and that a Globe of 12 Feet Circumference should be fixed thereon. The Architecture when the upper Part was made level, took the following Dimensions of the Frustum, *viz.* the Length of the slant Side 60 Feet, the Diameter at the Top 16 Feet, and the Circumference at the Base 145 Feet. What will compleating the Cone cost at 4*s.* 6*d.* per Foot solid, and what will be the Expence of Gilding the Ball at $4\frac{1}{2}$ *d.* per Inch square? *Ans.* The Cone 475*l.* 3*s.* $3\frac{3}{4}$ *d.* the Gilding of the Ball 123*l.* 15*s.* 1*d.*

190 *A Perpetual Almanack.* ACCOMPTANT'S
A TABLE shewing the dominical Letter from the Year of
our Lord 1400 to 2000, and may be continued for ever.

				C	E	G	BA
				1700	1400 1800	1500 1900	1600 2000
1	29	57	85	B	D	F	G
2	30	58	86	A	C	E	F
3	31	59	87	G	B	D	E
4	32	60	88	FE	A G	C B	D C
5	33	61	89	D	F	A	B
6	34	62	90	C	E	G	A
7	35	63	91	B	D	F	G
8	36	64	92	A G	C B	E D	F E
9	37	65	93	F	A	C	D
10	38	66	94	E	G	B	C
11	39	67	95	D	F	A	B
12	40	68	96	CB	E D	G F	A G
13	41	69	97	A	C	E	F
14	42	70	98	G	B	D	E
15	43	71	99	F	A	C	D
16	44	72		ED	G F	B A	C B
17	45	73		C	E	G	A
18	46	74		B	D	F	G
19	47	75		A	C	E	F
20	48	76		GF	B A	D C	E D
21	49	77		E	G	B	C
22	50	78		D	F	A	B
23	51	79		C	E	G	A
24	52	80		BA	D C	F E	G F
25	53	81		G	B	D	E
26	54	82		F	A	C	D
27	55	83		E	G	B	C
28	56	84		DC	F E	A G	A B

At the Top of the Table are placed the even Hundreds, with their Dominical Letters over them; as 1400, 1800 has E, &c. At the Side are the Parts of every Hundred, with their Dominical Letters against them, as 1, 29, 57, 85, have B, D, F or G, according to which Century they belong, as the Dominical Letter for 1765, is found in the Angle of Meeting to be F, for 1768, C B, it being Leap Year, C being used till the 25th of February and B the rest of the Year. A

A TABLE shewing what Day of the Week any Month in the Year begins for ever, by the Dominical Letter.

Months	A	B	C	D	E	F	G
Jan. 31	Sunday	Saturd.	Friday	Thursf.	We.	Tue.	Mon.
Feb. 28	Wedn.	Tuefd.	Mond.	Sunday	Satu.	Frid.	Thu.
Mar. 31	Wedn.	Tuefd.	Mond.	Sunday	Satu.	Frid.	Thu.
Apr. 30	Saturd.	Friday	Thursf.	Wedn.	Tue.	Mon.	Sun.
May 31	Mond.	Sunday	Saturd.	Friday	Thu.	We.	Tue.
June 30	Thursf.	Wed.	Tuefd.	Mond.	Sun.	Satu.	Frid.
July 31	Saturd.	Friday	Thursf.	Wedn.	Tue.	Mon.	Sun.
Aug. 31	Tuefd.	Mond.	Sunday	Saturd.	Frid.	Thu.	We.
Sept. 30	Friday	Thursf.	Wedn.	Tuefd.	Mon.	Sun.	Satu.
Oct. 31	Sunday	Saturd.	Friday	Thursf.	We.	Tue.	Mon.
Nov. 30	Wedn.	Tuefd.	Mond.	Sunday	Satu.	Frid.	Thu.
Dec. 31	Friday	Thursf.	Wedn.	Tuefd.	Mon.	Sun.	Satu.

When you have found in the last Table the Dominical Letter for the Year you want, under the same in this Table you will have the Day of the Week each Month begins on throughout the Year. The Figures which are fixed with each Month shew the number of Days; but in Leap-Year, February has 29 Days. Example, On what Day of the Week will New-Year's Day (being the 1st. of January) happen for 1766? The Dominical Letter in the last Table being found to be E, then in this Table find on the left Side January, against which underneath the Letter E, is Wednesday, the Day of the Week required.

When it is Leap-Year, and has two Dominical Letters, such as 1772, which are E D, the first Letter E, shews only that January begins on Wednesday, and February on Saturday; but D the second Letter shews the Beginnings of all the rest.

Day

AT
un.
To
u.
re.
h.
ri.

he

of

a-
e,
ne
ll
p
h

n
?
e
l
e
r